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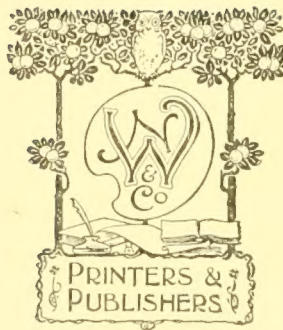
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ZANCLOGNATHA GRISEALIS, AB.



THE above curious aberration of *Zanclognatha grisealis* was captured at Wye, in Kent, by Mr. Percy Richards, on June 3rd, 1910. Compared with normal specimens it is rather larger in size and somewhat paler in colour; the lines are blacker and thicker. The chief peculiarity of the specimen is that the first and second lines are close to each other; the former is straight as usual, but nearer the middle of the wing; the latter is obtusely angled at end of the cell, touches the first line on the costa, and approximates thereto on the inner margin.

This species is a fairly constant one. It certainly exhibits slight variation in the tone of ground colour, but aberration in marking would seem to be very exceptional.

RICHARD SOUTH.

NOTES ON THE LIFE-HISTORY OF *PARARGE HIERA*, FABR., WITH DESCRIPTION OF THE FULL-GROWN LARVA.

BY W. G. SHELDON, F.E.S.

WHILST at Semmering last June I confined several females of *Pararge hiera* over plants of various grasses for ova, which were deposited sparingly; in all I obtained about three dozen, the ova, which were light green in colour, being of the usual round Satyrid form, and affixed in ones and twos by the parents to a blade of grass very near the apex; in no case were they more than one inch from it.

The ova, on my return to England, were kept in a room which had an average indoors summer temperature, and the larvæ emerged at the end of the month. Shortly after emergence they were transferred to a greenhouse which in the summer is kept without artificial heat, the door and top-lights in the day open, and the roof shaded by tomato-plants. Under these conditions the average temperature would be somewhat warmer than that of the surrounding atmosphere not protected by glass, especially at night. The larvæ throughout fed slowly, showing no tendency to produce an autumnal emergence of imagines, and the first one did not pupate until the end of August; two others, the only ones to reach maturity, did not commence to change until the middle of September. I tried them on various grasses, but the only one they would eat freely was *Dactylis glomerata*, and, so far as I was able to see, they fed exclusively by night, remaining stretched out at full length on their food-plant during the day.

The full-grown larva is about 30 mm. in length when stretched at rest on a blade of grass. The head is very rounded and prominent, and much wider than the second segment, which gives the larva the appearance of having a distinct neck; it is grass-green in colour, thickly sprinkled with lighter tubercles, each one of which emits a green spine; the ground colour of the remainder of the segments is of the same tint of green as the head, but lighter, and the tubercles and spines are at much greater intervals. The centre of the dorsal area from second to anal segments is darker than the rest, and is bounded on the sides by green stripes of lighter colour than that of the general area; these two stripes are each about one millimetre in width in the centre, and taper off at each end, those towards the anus terminating in points; half-way between these stripes and the spiracles are another pair of stripes which have the upper margins of the same dark colour as the mid dorsal area, and which gradually shade off below to the colour of the general surface, the spiracles being green and inconspicuous. In the spiracular area is another pair of stripes of the same tint as those previously described. The anal points are light green and very spiny; the ventral is of the same colour as the dorsal area.

Pupation is certainly not subterraneous; the three larvæ which eventually became pupæ attached themselves by the anal extremity to a pad of silk spun on the roof of the cage, but did not seem to have the strength to retain that position, and before changing, or possibly in the act of changing, fell to the soil on the floor of the cage and changed there; probably a cold snap which just then intervened was responsible for this. The pupa is green, of the same tint as the larva, and is about 12 mm. long.

There seems some doubt as to whether this species is usually

double-brooded. It is true that Dr. Kane and Dr. Lang give the emergence as from May to July, but, as the species occurs in Central Europe from about 2000 ft. to considerably over 5000 ft., the difference of altitude would account for this variation of dates, without assuming that there was more than one brood; but Mr. Wheeler, in his 'Butterflies of Switzerland and the Alps of Central Europe,' gives two records which seem to prove conclusively that—in some instances, at any rate—*Pararge hiera* is double-brooded; they are "Gruyères, August 30th, 1897 (Rowland-Brown)," and "Certosa di Pesio, June and end of August, 1892 (Norris)." Both of these localities are at about 2000 ft., and therefore it seems probable that *P. hiera* is a single-brooded species everywhere except at the lowest levels on which it is found. I may mention that the females captured by me at Semmering were taken at an altitude of from 3000 ft. to 3500 ft.

[Prior to the publication of Mr. Sheldon's paper it may be safely assumed that no British entomologist had successfully bred *Pararge hiera* through all its earlier stages. However, Herr J. Peyron, a member of the Entomological Society of Stockholm (Ent. Tidskrift, 1905, pp. 249–251), supplements Spuler's scanty note on the larva (Raupen Gross-Schmette. Europas, p. 50) with an excellent life-history of the species, including many interesting observations additional to and confirming Mr. Sheldon's.

The larva is hatched eight days after oviposition, and pupates after three moults only, "as is the rule in the genus *Pararge*," extended over six weeks in all. Under natural conditions the pupa is suspended head downwards from a blade of the food-plant (*Phleum pratense*), without other attachment ("fritt"), and in Scandinavia, as doubtless elsewhere where there is but one brood, passes the winter in this stage.

Spuler, quoting Dorfmeister, of Vienna, but without reference to any particular publication, gives *festuca* as the food-plant. Frionnet (Premiers Etats des Lépid. Fr., p. 263) supplements this with *holecus*, probably on the same authority, adding "larva from September to April," which, in the light of Herr Peyron's and Mr. Sheldon's researches, is obviously inaccurate.

As to the two emergences, Frey (Lepid. der Schweiz, Lemann's translation, p. 36) leaves us in no doubt. He writes: "Butterfly twice a year in the plains and hilly districts. First brood from the first days of May, and then in July and August." At greater altitudes there is only one emergence, as, for instance, in the Balkans, where Mrs. Nicholl found it very common on the Rilo Dagh, at about 5–6000 ft., in June (Elwes, "Butterflies of Bulgaria," Trans. Ent. Soc. Lond. 1900). I myself took it on the summit of the Stelvio in mid-July, 1900, but I regret to say that, on looking over my series, I can find none of those recorded

as from Gruyères, my impression now being that certain small and dark examples of *Pararge mæra*, since arranged in their proper place and bearing a Gruyères label, are the then-supposed *hiera*. But, of course, this does not in any way affect the evidence of *hiera* being double-brooded there, and elsewhere at suitable levels. — H. ROWLAND-BROWN.]

A POSSIBLE HYBRID OF *AGRIADES THETIS* ♂
AND *POLYOMMATUS ICARUS* ♀, OR OF *A.*
CORYDON ♂ AND *P. ICARUS* ♀.

BY T. REUSS.



AGRIADES HYBRID.

THE above figure represents an interesting "blue" taken by Mr. L. W. Newman, of Bexley, in mid-September last at Folkestone while drying its wings after emerging from the pupa. In the upper side facies the brilliant blue, the marginal black-and-white spotting in the hind wings,* strongly suggest the parentage of *A. thetis*, while the almost pure white (aberrative) fringes with some signs of the inner grey border of *P. icarus* in the apex and slight black projection of the veining in the anal and outer angle of the hind wing suggest the influence of *icarus*. The strong blackening of the nervures, however, reaches as far into the wing area as in *A. corydon*; the first black spot in the outer angle of the hind wing is also like that in *corydon*, and there are black and whitish scales mixed in with the blue ones in the margin of the fore wings, especially near the apex. These details may be aberrative,† but it is perhaps thinkable that a hybrid between *A. corydon* ♂ and *P. icarus* ♀ would exhibit a *thetis*-like facies, as described, with intensified black markings. The wings are less rounded than in *icarus*—they are more

* I possess a male *P. icarus* aberration, recorded in the Ent. Rec., vol. xxi. pt. 9, which is strongly spotted in the hind wings upper side, and which, as I only now noticed and could verify with a lens, has some white scales mixed with the blue ones beneath some of the black spots, especially of those in the anal angle of the left wing.

† One must also be on the look-out for secondary sexual characters of both sexes in hybrids; hybridism favours their mixture. A black suffusion of the fore wing margin occurs sometimes in ♂ *P. icarus* ab.

angular, as in *thetis*; their shape suggests the issue of a crossing between two differently-sized species. I do not know whether the displacement of the spots in the under side may be also counted as evidence in this direction.

In the under side there is something of *corydon* as well as of *thetis* and *icarus*; the colouring is very light, the hind wings are distinctly more yellowish than the fore wings, which are whitish, thus reminding of *corydon* ♂. There is no orange in the marginal lunules of the fore wings.

I am told that in the locality where the specimen was captured, at a time when *icarus* were worn and *thetis* were fresh, these *A. thetis* and *P. icarus* swarm, while *corydon* is rare. As the case stands, evidence seems very much to favour the verdict of *A. thetis* ♂ and *P. icarus* ♀ in decision of the parentage; but, on the other hand, I think that the traits of *A. corydon* in the specimen, if not readily explainable by aberration, are still sufficient to maintain a doubt.

I will name this interesting form after its captor, *Agriades* hybr. *newmani*.

NOTES ON A BUTTERFLY HUNT IN FRANCE IN 1910.

III.—BASSES-ALPES AND ISÈRE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from vol. xliii. p. 327.)

SINCE the publication of my last paper in December ('Entomologist,' xliii. pp. 322-327) I have had an opportunity of inspecting the little collection of butterflies made by Mr. Warren during our brief halt at Rosans (Hautes-Alpes). A Hesperiid taken by him there turns out to be a male of *Pyrgus proto*, in splendid condition, showing a decidedly greener under side than the specimens in my collection from Albarracin, and on the upper rather lighter than true Spanish forms. So far as I can gather, the discovery of this unmistakable species in the Hautes-Alpes constitutes a record, though it occurs at Digne, in the southern adjoining Department.

Meanwhile, it is with some diffidence that I proceed to give a short account of our entomological experiences in the Basses-Alpes. Digne is nowadays almost as well known to lepidopterists interested in the extra-British fauna as the New Forest district to those who confine their attention to the United Kingdom. Every year the number of those who "take their walks abroad" increases, and as surely as the fly gravitates to the honey-pot, or perhaps I should say, the moth to the treacle, so

surely the "palæarctic" collector turns his steps towards the pretty little capital of the Basses-Alpes. I myself have visited Digne on six separate occasions during the past eleven years, but, curiously enough, this was the first July I ever spent there. Early April, mid-May, and mid-June, twice in August, and once even in October—these are my seasons, and as it had always been a case of "*semper aliquid novi*" in the past, so I looked forward to turning up something new again this year, especially as I was to spend considerably over a fortnight on the lavender-grown valleys, and upon the hot hills which surround the town.

We arrived at Digne in as heavy a thunderstorm as I ever remember to have encountered, the rain descending tropically; the night decidedly cool and pitch dark, and it was not until I threw open the shutters of my favourite room in the "Boyer-Mistre" next morning that I realized the surprises were not to be altogether entomological! The splendid plane avenue, the delight of so many summer evening's shade, had been shorn of its magnificence; the upper branches levelled with the house-tops, and the trunks left hopeless and forlorn! But the sky was clear, and municipal zeal had not extended itself to reforming the characteristic odours of the "Rue de Paradis" and the other crabbed alleys which lead to the Dourbes and the Eaux-Thermales roads. Yet here was another unwelcome spectacle. The garden espaliers, normally laden with fruit, were almost empty; the long lines of walnut trees covered with the charred festoons sered by a late phenomenal May frost—the cause of havoc to crops, orchards, and vines throughout the district, and, as we were soon to discover, to the insect life and wild flora as well.

With regard to emergences, everything appeared to be topsyturvy. The earlier warm weather of spring had apparently brought out half a brood, leaving the other in abeyance until July. Some of the usually butterfly-haunted spots round Digne for several days produced next to nothing except shoals of *Rusticus argus* (*ægon*), of which I had actually a full-fed larva at the time I was taking perfectly fresh males and females, both sexes, as with other butterflies, appearing simultaneously. On July 7th, in the Eaux-Thermales Valley, males of *Papilio alexanor*, which in 1899 was out in the second week of June, were still quite fresh, this species, with *Parnassius apollo*, also in fine condition, practically constituting our bag that day; the wind being high and the temperature anything but suggestive of the southern summer. Remarkable also was the scarcity of Anthrocerids. Usually abundant in the abandoned vineyards and *garrigues* at the back of La Collette, on the 8th they were conspicuous only by their absence, and although we spent the whole of a fine warm morning there,

hardly any butterflies were on the wing except *R. argus*, *Leptosia sinapis*, *Colias hyale*, *Satyrus cordula*, and *Polyommatus escheri*, Mr. Warren netting a single *P. admetus* var. *ripertii*. Matters mended, however, somewhat later in the day, when the Eaux-Thermales Valley yielded, in addition to the Papilionidæ mentioned above, *Argynnis daphne*—some worn, some quite perfect—*Gonepteryx cleopatra*, *Thecla ilicis*, *T. spini*, *Polyommatus hylas*, and the following “skippers”: *Hesperia carthami*, *Thymelicus actæon* (males only, very common), and *Pyrgus sao*. Magnificently coloured females of *P. escheri* were also not infrequent. It was curious to observe, however, that of the earlier butterflies their size was abnormally small, and this in a locality noted for the grandeur of its examples. *Aporia crataegi* we came across here, as well as at the higher levels, were no larger than the males of *Limenitis camilla*. A male *P. hylas*, normally as large as our finest *P. corydon* at home, measures hardly more than a normal British male *R. argus*.

Our first expedition to the Dourbes was made on July 10th, but unfortunately after a brilliant morning—we started soon after 5 a.m.—the weather became cloudy at noon; that is to say, when we had been at the top somewhere about an hour, having missed the more direct road up the cliffs. Added to this, a furious wind preceded the departure of the sun, and it was with difficulty that we made any captures at all upon the actual ridge. Evidently here above, as on the lower ground round Digne, the emergence of many species had been arrested by the low temperatures of May. We were, in fact, among the spring butterflies again; though very few were in good condition. Remnants of *Erebia evias* indicated a rather plentiful generation, and there were quite a lot of *Parnassius mnemosyne* about, nearly all decidedly *passés*, but one or two males quite perfect! More remarkable still was the apparition of *Pararge hiera*, also wholly dilapidated; a species I do not remember to have seen recorded from the Dourbes heretofore, the reason no doubt being that few collectors who visit Digne earlier in the year think it worth while to ascend so high. The lavender, of course, was not out at this altitude, but the sides of the steep precipitous cliffs where *Erebia scipio* is fabled (?) to fly, were covered with flowers, and for the first time the Anthrocerids were seen in profusion; a particularly welcome find being the pretty little *A. gallica*, Obth., a new species to me. *Erebia stygne* was, however, the only butterfly in good condition that we came across otherwise than singly until we had once more returned to the glades of the pine forest, where, among the lush-green grasses and vetches, *Nomiades semiargus*, *Cupido minimus*, and *Everes coretas* were common enough, though we did not discover that we were disturbing the latter until almost out of the wood.

Five days later, on July 20th, a second expedition over the same ground produced little besides the butterflies already mentioned, with *Melitæa parthenic*, and, near Villars, on the way home after a very hot walk, *Polyommatus damon* (which curiously enough had not yet put in an appearance lower down in the Eaux-Thermales Valley at this date) and one or two fresh *Thecla acaciæ*.

Four days earlier, opposite the Bath Establishment Hotel ("auberge" would be a better name for it!), I encountered for the first time at Digne *Libythea celtis*, a single male of which, after hovering over some wild clematis just out of net-reach, flew up into the cherry trees and disappeared. But at the back of La Collette next morning Mr. Warren secured another male, and on the road that day we saw our first and last *Satyrus fidia*. Most collecting days were devoted, however, to the valleys of the Eaux-Thermales, and right in the river-bed, having scrambled down from the road after a fine female *P. alexanor*, we came upon what was evidently a favourite haunt of the hitherto elusive *Polyommatus admetus* var. *ripertii*, for with the males of *P. meleager*, now in all their glory, this was here the commonest of "blues." Both males, and in lesser numbers females, were flying in abundance over a dry, sandy promontory at the edge of a wood-path, where also the fine brilliant southern form of the female *Chrysophanus dorilis* frequented the flowers of a golden daisy, Mr. Warren netting one specimen almost of the ruddy copper-red of the male *C. hippothoe*. Nor did his successes with the Chrysophanids end here, for, as at Nyons, he was able to count among his spoils male examples of *C. alciphron* var. *gordius*, female ab. *midas*, Lowe. *C. virgaureæ* was hardly out, and I saw only an occasional male before leaving on July 23rd.

On the whole, *P. alexanor* was plentiful, and it was a great pleasure to watch the females ovipositing on the young plants of *Seseli montanum* practically wherever they grew, and on both sides of the Bléone River. They would hover a moment over an unoccupied stem, then settle, bowing the delicate filamentary shoots to the ground, and deposit a single egg at the junction of the leaf with the stem. On no occasion did I find two laid side by side, or anywhere near to one another, and the females seemed instinctively to discriminate plants already visited. About a dozen ova I carried home at different dates, and when Mr. Warren left for England on the 21st he took with him a small colony, some already in the second instar, of which I had small hopes, having been assured that a change of food-plant would be fatal to them. Yet they took quite kindly to the Amersham carrots; though all died from some unexplained cause in the third instar, leaving the life-history of the species still to be written and illustrated by a British authority! The range

of this splendid *Papilio* no doubt is far more extended west and north in France than the local catalogues suggest. Mr. Warren tells me that he saw several from the train windows far north of Serres on the Digne-Grenoble line.

Very little rain fell during the whole time we were at Digne, but there was nearly always a high gusty wind, and at the commencement of our stay a disagreeable preponderance of cloud. And just as we arrived in a storm, so I left in a downpour, accompanied by thunder and lightning, the rain lasting right up to Clelles (Isère), my next stopping-place, and the night so cold that it might have been early spring instead of the height of the calendar summer. Grey and black, indeed, was the 24th, and so discouraging the outlook, that I did not take my net with me when at length I made up my mind for an afternoon walk. But the unexpected happened of course, and crossing a heap of stones covered with flowering-plants, I put up a magnificent black variety of *M. parthenie*—so black that I thought at first it must be an *Erebia*. I had my hat off in a minute; actually got it over my *parthenie*, and was just boxing it when a terrific puff of wind blew hat, pill-box, and butterfly out of my hand, and I saw the latter borne swiftly over a deep precipice! And that was about the only insect I saw on the wing that day, though there is plenty of good collecting ground all up the western valley, which opens on the railroad and the lower levels some little distance in the direction of Grenoble.

The next day being still cold but fine, I decided, therefore, to try over the same ground on the very off-chance as I thought of a similar encounter. To this extent I may count myself fortunate, for, at the very spot where I had missed *parthenie* the day before, I took the self-same specimen—recognized by certain rubbings of the wings; and on the way back, a couple of hours later, another almost identical, but absolutely perfect, suggesting that hereabouts a race of "black" *parthenie* was established, of almost the form which I find named and exquisitely figured ('*Lépidopterologie Comparée*,' fasc. iv. plate xliv.) by M. C. Oberthür as *ab. rhoio*, Obth. And in this connection I may add that I have yet another but much smaller example, apparently a like aberration of *M. parthenie* var. *varia*, M.-D., which was taken by me when collecting with my friend Mr. C. J. Johnson at the top of the Simplon Pass in July, 1907—another very fine dark aberration from the same ground being referable, I think, rather to *M. aurelia*. A few typical *parthenie* were also noted on the outskirts of the woods which were carpeted with *Melampyrum* in full flower, and with them not a few males of *Polyommatus damon* and *Chrysophanus virgaureæ*; the road attracting *Satyrus circe*, and the steep shaley banks *Parnassius apollo* and *Erebia stygne*, with occasional *E. ligea*.

But this was the last day of my collecting abroad for the

season of 1910, which will be remembered by me as far the wettest and most disappointing for many years, in a country where sunshine, as a rule, can be relied upon throughout the summer, at all events out of the higher mountain districts.

Harrow, Weald: Dec. 1910.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. GEORGE WHEELER, M.A., F.E.S.

(Continued from vol. xliii. p. 337.)

I HAVE notes by Mr. Powell, with comments thereon by Mr. Sloper, on the larva of *M. deione* from the South of France. They are, however, written from such a different point of view, the comparison being made with *M. didyma*, and not with *M. athalia*, of whose earlier stages Mr. Powell, at the time these notes were written (1904), said that he had no distinct recollection, that I do not think anything would be gained in the present connection by copying them as they stand. Most of the details given would apply equally well to other species of this group, and there is no point specially remarked upon in which they differ from var. *berisalisensis*. In sending these notes to Mr. Sloper, Mr. Powell enclosed some specimens of the food-plant, observing that the larvæ, when he received them from M. Foulquier, had eaten all the flowers of the plants sent with them; on this Mr. Sloper remarks that the food-plant is the same species of *Linaria* as that on which the larva of *berisalisensis* feeds, and that the latter also eat the flowers in preference to the leaves. Mr. Powell's larvæ must, from the date (June 13th), have belonged to the second brood, and it may be observed that the first brood larvæ, after hybernation, can have no opportunity of indulging this taste, as their food-plant is not in flower during the early spring.

The larva of *britomartis* was described by Assmann as follows:—Size of a small *cinxia*; head and legs black, the former possessed on the upper surface of small raised spots of a white colour, on which are short black hairs; the cylindrical body, abdominal and anal legs pearly white, generally finely latticed with violet-grey; only one stripe on the back and two on the sides are somewhat strongly marked. The clean white warts have black hairs, and stand on fairly large rust-yellow spots, which often coalesce and then form a broken band on each separate segment. On this Rühl remarks (Soc. Ent. v. p. 106): "According to this description the larva is strongly separated from all *Melitæa* larvæ known to me, and Assmann would be right in making it a separate species." One cannot read this

observation of Rühl's without some feeling of surprise, since, so far as one can judge from the description, the larva is quite of the usual type of the group, differing only in having more white in the ground colour, going in this respect apparently somewhat further than the larva of its nearest relative, *dictynna*, which shows more white than any other of the group with whose larva I am acquainted.

It does not appear to me to be worth while to quote the short descriptions of the larvæ of "*veronica*," *athalia*, and "*parthenie*" given by Dorfmeister in the 'Verhandlung des zool.-bot. Vereins,' iii. p. 136, since the first two might as well refer to one as to another of the group, and the third in which the spines are said to stand on pale flesh-coloured bases merely serves to show that he was quite unacquainted with the larva of *parthenie*, a fact which is made absolutely certain by his description of the corresponding pupa, which differs in every characteristic from that of real *parthenie*.

It is a matter of great regret to me that I have so far been unable to obtain any information on the early stages of *varia*, but of the only two friends from whom I should have been likely to obtain reliable information on the subject, the one, Chanoine Favre, died some time ago, and the other, his collaborator, M. Arnold Wulschlegel, has now for many months been completely paralysed, a fact which many English collectors in the Rhone Valley will, I am sure, learn with the greatest regret.

The name of M. Wulschlegel reminds me of a rather absurd discussion which took place some few years back as to whether the larva of *athalia* hibernates gregariously. Knowing how frequently he had bred the species, I inquired as to his experience, and he informed me that they invariably hibernated in a common "tent" like the other Melitæas, remaining together after hibernation until they had eaten the plant at the roots of which (of course not underground) they had passed the winter, and then separating. I had only asked him the question in confirmation of my own experience, having found many "nests" of *athalia* larvæ at the early period of their hibernation.

Buckler describes the pupa of *athalia* as follows:—"Half an inch in length, very plump, with the usual angles much rounded off; the abdominal rings bear little rounded eminences—traces of the larval spines; the tip of the abdomen is bent back at nearly a right angle, and there is a slight depression between the abdomen and thorax, which is broad and rounded. The wing-covers are well defined and rather prominent, the warmish white colour and texture of the pupa-skin may be compared to that of biscuit china; each abdominal ring is adorned with a transverse brownish orange bar, having on its hinder edge squarish black spots, or sometimes a black bar with orange spots, and followed by a row of tiny black dots. The back of

the thorax is marked with triangular streaks of black outlined with orange; the antenna-cases and wing-nervures are faintly marked with orange-brown, and the wing-covers and eye- and leg-pieces with strong black blotches and dashes."

All the above remarks, so far as shape, general appearance, and so forth are concerned, refer equally to the pupa of other members of the group.

The following notes have been made from pupæ bred by myself:—

Aurelia.—Pupa: General appearance very pale blue-grey, with transverse lines of orange, and black dots. Wing-cases darker blue-grey, with a row of very short black lines at the edge, interrupted below the middle and at lower end. Poulton's line distinctly visible. Under a lens the ground colour is seen to be white slightly tinged with blue, with fine black reticulations. Spiracles black, surrounded by white, patched with orange-brown. Anal segments recurved; tendency to pupate suspended (not universal).

Parthenie.—The pupa is very like *aurelia*, but darker, and has the border of black dashes on the wing-cases uninterrupted. The tendency is to pupate under the leaves.

With regard to the distinction in the markings on the wing-cases of *aurelia* and *parthenie*, it is, I think, reliable. When Mr. Sloper and I were breeding these two species from larvæ which we had found, he kept the two species in separate cages; some of mine were also kept separate, but some were intentionally mixed together. When we carefully examined his pupæ this was the most noticeable distinction, and by this I separated my pupæ, which in every instance bred true. As these larvæ only represented one locality for each of the species (Sion and Charpigny respectively), the distinction *may* not be of universal application, but it seems likely to be constant, judging by this test.

Var. *berisalensis*.—Pupa: General appearance dull dark bluish grey with orange tubercles; wing-cases dark mottled brown, except when too dark to show markings. Under lens: No blue colour as in the other two species (*aurelia* and *parthenie*), but intersegmental bands of slate-colour, with white and slightly pinkish spots; orange humps in the positions of the larval spines arranged on black and white spotted transverse bands; wing-cases of white ground colour, but almost (sometimes entirely) covered with brown markings; anal end recurved, with two scarlet humps (sometimes dull); humps on thoracic segments white tipped with orange; the pupæ vary considerably in amount of slate-colour, black and white; also in depth of wing-markings, sometimes having a reddish tinge, sometimes being almost jet-black. The pupæ are only very slightly suspended.

Mr. Powell's description of *deione*, which was made from a

single specimen, corresponds in colour and markings with some of my specimens of *berisalensis*. He adds the following measurements: Total length of pupa under observation, 11·5 mm.; from anterior extremity to apices of wing-cases, 8·3 mm. Depth of thorax, 3·5 mm.; of third abdominal segment, 4·55 mm. Width of thorax, 3·9 mm.; of third abdominal segment, 3·8 mm.

The following are my notes on a pupa of *dictynna* which I bred: Ground colour whitish, with black interrupted transverse bars with orange humps, the central hump being in advance of the others; posterior segments black; fifth white segment, counting from the black segments, bears a diamond-shaped black patch; wing-cases white with broad black markings, but no row of black dashes at the margin; spiracles black in yellow rings; antenna-cases black.

Assmann describes the pupa of *britomartis* as follows: White, with small rust-yellow warts and pale- or black-brown spots and dots between them and in the intersegmental spaces. The wing-cases are of the same pale or dark brown colour, with the exception of two rows of lunules, a spot in the disc, another in the middle of the outer margin, and the fine nervures.

It may be worth while to give Dorfmeister's account of the pupa which he wrongly ascribes to *parthenie*, as it might lead to the identification of the species to which he assigned this name. It is as follows: Pearl-coloured, mostly shining, with black markings, back of the abdomen smooth, without raised points, and without yellow spots.

(To be continued.)

THE NUMBER OF LARVAL STAGES OF *LYCÆNA ACIS*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

To bear out my previous statements in the 'Entomologist' for November (vol. xliii. p. 305), I should like to add the following notes which I have copied from those accompanying each drawing I made, showing the different stages of the larva of *acis*. These may be of some interest to Dr. Chapman, and I trust he will consider them sufficient to show that I am correct in saying the larvæ under my observation passed through five distinct moults; but I feel sure, if he saw the drawings, he would be still further convinced that I am not in error.

I can only repeat my previous statement that the appearance of the cast skin beside the particular isolated individual after each moult must be taken as adequate proof that the particular larva, so kept under critical observation, moulted at the time.

Of course, as Dr. Chapman remarks, the enlargement of the head after a moult is indicative of another stage. .

Notes accompanying the drawings as follow:—

Fig. 4. Segment directly after emergence ; drawn July 15th, 1907.

Fig. 5. Shortly before *first* moult ; drawn July 23rd, 1907.

Fig. 6 *a, b*. Before *second* moult (*a*, after first moult) ; drawn July 31st, 1907.

Fig. 7. Before *third* moult ; drawn August 6th, 1907.

Fig. 8. Hybernating (after second moult) ; drawn Jan. 21st, 1908. Entered into hybernation about August 10th, 1907.

Fig. 9. Fixed for *third* moult ; drawn April 11th, 1908. This one left its hybernaculum March 20th, and has since been feeding on furze-blossoms twenty-two days after hybernation ; 239 days old.

Fig. 10. After *third* moult, 245 days old, moulted third time April 8th, 1908 ; drawn April 17th, 1908.

Fig. 11. After *fourth* moult and fixed for fifth moult, about 260 days old ; drawn May 2nd, 1908.

Fig. 12. Fully grown, after *fifth* moult, about 275 days old ; drawn May 19th, 1908.

Figs. 9, 10, and 11 are different individuals, but each kept separate for observation with full data.

AN AUTUMN MORNING IN THE ALLEGHANY MOUNTAINS.

BY MARGARET E. FOUNTAINE, F.E.S.

THE morning mists are thick and heavy in the valleys through which the Jackson River flows on towards the big Atlantic Ocean far away ; but these misty mornings are almost invariably the forerunner of a glorious autumn day. And it is good to climb up the creeks and amongst the lower spurs of the Alleghany Mountains, notwithstanding that there is almost "nothing doing" here now amongst the butterflies, for the fall is fast coming on, and the green leaves are rapidly turning red and gold, as the sunset of the year approaches ; and the butterflies, too, for the most part, are of sunset colours—the deep golden *Terias nicippe* being one of the commonest to be met with, perhaps only to be outnumbered by *Colias philodice*, more especially if in the neighbourhood of some strip of clover-land. Two species of *Grapta* are still worth netting—*G. interrogationis* (I always regret its name !) being a very fine species, with its pale blue borders to its wings, and *G. comma* (a very close ally I should think of our *G. c-album*) are sometimes well in evidence, though very wary and difficult to catch. But what we are most

looking out for is the dark apparition of the iridescent *Papilio philenor* fluttering in ecstasy over some thistle-head, and probably quite freshly emerged, though *P. troilus* is already almost vanished altogether, only perhaps some shattered female seeking spice-wood whereon to deposit her eggs is to be seen. The larvæ of this fine *Papilio* are to be found, after much searching, coiled up in the leaves of the spice-wood bushes, though far from abundant, and now getting more and more scarce, most of them being already in pupa for the winter. *Papilio ajax* is still to be seen, though rarely, and sometimes a freshly-emerged specimen, very darkly coloured, will fall a victim to my net; the papaw bushes (*Asimina triloba*) have fed numbers of *ajax* larvæ, but all these are in pupa now for the winter, only an occasional straggler being tempted to emerge to enjoy the warmth and sunshine of these short autumn days, instead of waiting in patience till the spring. *Danais plexippus* is to be seen everywhere; these huge butterflies fly plentifully even in the streets of the little town of Covington, an abundant brood having only just recently sprung upon us. Sometimes we are reminded of our friends across the water by the sudden joy of beholding *Vanessa antiopa* sail majestically by, and then the glorious scenery of the Alleghanies grows dim, and our eyes and our thoughts are dreaming of autumn forests in Central Europe, where this lovely insect is no doubt now still on the wing, and indeed probably much more abundant than here, where it is decidedly scarce. *V. atalanta* is also here, just as gay and gladsome as it ever is over there in the Old World, and presenting, as far as I can see, no variation whatever. *V. huntera*, too, was here a fortnight ago, but they are gone now; though worn specimens of *Euptoieta claudia* are still to be met with, and even *Argynnis cybele* is not absolutely vanished, and females in shocking condition are still fluttering about looking for violet leaves to lay their eggs on, the habits of the larvæ being exactly similar to those of our closely allied fritillaries. *Limenitis astyanax* is over now, and their larvæ are preparing to go into hybernation on the wild cherry and other woodland trees. Only once did we take a specimen of *L. disippus*, and then it so closely resembled its model, *Danais plexippus*, that it was caught under the impression that it *was* that species; this specimen laid nine ova, but though they all hatched out, they refused to feed on the leaves of the wild cherry, whereon a young *astyanax* larva was flourishing, and therefore all died. *Phyciodes tharos* may still be seen in woodland districts, and *Hesperia montivaga*, old and faded now, about completes all we have, or can hope to have, during this autumn ramble in the Alleghany Mountains.

Covington, Virginia: October 1st, 1910.

PRELIMINARY LIST OF APHIDIDÆ FOUND IN KENT.

BY FRED V. THEOBALD, M.A., &c.

LITTLE seems to be known of the Aphididæ found in Kent. The records are very few and yet the species undoubtedly very numerous. During the last fifteen years specimens have been collected or observed in different parts of the county. Many of these have not yet been identified. Careful collecting would probably reveal a very large number more, many new to Britain, and probably some new to science. Eighty species are shown here to have occurred in the county, and thirty remain unidentified.

These insects are of great economic importance and deserve more attention. At present we know but very little of their life-cycles, their varied migrations, or of the numerous subterranean forms. When one considers the enormous loss caused by these insects it is strange that they are so neglected. Probably this is for two reasons—first, that they are most difficult to get named, and, secondly, their bionomics are so abstruse that one dare not call any form a species.

Where such well-known aphides as we find in orchards on pear, apple, currants, &c., come from or go to we cannot say. A sudden “blight” attacks currants, and as suddenly, later on, leaves the currants. Where do they go to? what is their other host-plant? Probably we shall find that most of the Aphididæ have two host-plants, just as we see in the hop aphis, the elm leaf-curling aphis, the mealy plum aphis, and others.

The following is merely a preliminary list of the aphides I have found in Kent, and it is hoped a second will be complete in another few years.

One reason I record these insects is because in a brochure I have recently bought in Berlin on the ‘Insects of Kent’—a paged proof of some ‘County History’—no mention is made of the Aphididæ. In the same county list one also notices that some of the most abundant insects, and some which annually cause thousands of pounds of loss are not even mentioned, such as the apple-sucker (*Psylla mali*) or the apple-blossom weevil (*Anthonomus pomorum*), and others of great economic importance.

APHIDINÆ.*

Genus SIPHONOPHORA, Koch.

Siphonophora rosæ, Réaumur.—Common generally over the county, judging from the wide localities it has been seen in or sent from. This species is a migrant to and from the teasle; at least I can detect no difference between the two insects.

* I have followed here the nomenclature used by Buckton, as his is the only British work we have to refer to, but I do so with some hesitation.

S. granaria, Kirby.—Found all over the corn districts and elsewhere. I have never known any serious damage caused by it to corn in this county. Found on meadow foxtail grass at Wye. The green apple aphid (*Aphis fitchii*) placed in a cage with corn and grasses became winged and went to the latter. The progeny seemed to me the same as *S. granaria*. It is probable that these are merely dimorphic forms.

S. chelidonii, Kaltenbach.—Wye, July, 1901, 1904, on raspberry and on celandine in May in 1904; Crundale, on celandine, in May, 1909.

S. fragarie, Koch.—Wye, July, 1905, 1906; Swanley, 1902; Sevenoaks. On wild and cultivated strawberries.

S. millefolii, Fabricius.—Wye, August and September, 1910; thickly coating the stems of the common yarrow (*Achillea millefolium*).

S. circumflexa, Buckton.—Wye, December to May, under glass; Swanley, June; Sellinge, July; Canterbury, May. On geraniums, arums, and other plants in greenhouses.

S. diroda, Walker.—Wye, June, July, August, on roses and on wheat and barley; Tonbridge; Ash; Canterbury. I feel sure there is a migration between the rose and *Graminaceæ* of this species. Generally common on roses.

S. pisi, Kaltenbach.—Wye, abundant always, very harmful in some seasons, notably 1908, to field and garden peas; Dover, 1904; Appledore, 1901; Tenterden, 1899.

S. pelargonii, Kaltenbach.—Wye, Sellinge, Ashford, Linton, on geraniums and calceolarias in the open and under glass.

S. lactuce, Kaltenbach.—I have seen this in most gardens I have visited in the county, and think the same species occurs on red currants.

S. rubi, Kaltenbach.—Wye, Dartford, Tonbridge, Sellinge, Westwell, on the raspberry and also on bramble in May and June; it occurs on the raspberries later. Curls the leaves of the latter, but never does much harm.

S. urticae, Kaltenbach.—Wye, Westwell, Ashford, Whitstable, Tunbridge Wells. Often very common on nettle.

S. carnosa, Buckton.—Wye, 1900, on stinging-nettles.

S. avellane, Schr.—Common all over the county where nuts are cultivated, and may be found on wild hazels. It often swarms on cobs and filberts, but seems to do little harm.

S. rosarum, Walker.—Common on wild and cultivated roses. I have found it in most localities where looked for.

S. sonchii, Linnaeus.—Wye, Hastingleigh, on *Sonchus* and *Centaurea nigra* in 1902; heads of the latter smothered by it.

S. fragariella, Theobald.—Swanley, 1905, on strawberries under glass.

Genus PHORODON, Passerini.

Phorodon humuli, Schrank.—The common hop aphid, found in all hop-gardens in Kent, and also on sloe, damson, bullace, and plums. Migrates between the hops and prunes. Frequently causes endless loss to hop-growers and much expense in washing every year.

Genus MYZUS, Passerini.

Myzus cerasi, Fabricius.—Widely distributed over the county. Sometimes does considerable harm to cherries.

M. persicæ, Sulzer.—Wye, 1901 and 1907, on peaches and nectarines, not seen since.

M. ribis, Linnæus.—Common all over the county on red currants and on gooseberries. Often very harmful.

Genus RHOPALOSIPHUM, Koch.

Rhopalosiphum ribis, Linn.—Common on red and black currants, but mostly on the former in all parts of the county, June and July. I do not think that the red blisters on the leaves are caused by this aphid at all.

R. lactucæ, Kaltenbach.—Paddock Wood, Wye, Sellinge, Linton, Swanley, Sevenoaks, Dover, Ash. This species occurs on sow-thistle and lettuce, and appears to be the same as the former species.

R. nymphææ, Linnæus.—I saw this on some yellow water-lilies on the military canal near Hythe in 1899, but have failed to find it since.

R. ligustri Kaltenbach.—Wye, August, 1901 and 1905, and Chilham, 1904, on privet in small numbers.

R. dianthi, Schrank?—I am not sure of the species, but it is apparently the common turnip aphid, and has occurred all over the county.

Genus MELANOXANTHUS, Buckton.

Melanoxanthus salicis, Linnæus.—This large and beautiful aphid I have found in abundance at Wye in osier-beds, where it does considerable damage some years, often occurring in enormous colonies.

Genus SIPHOCORYNE, Passerini.

Siphocoryne capreæ, Fabricius.—Wye, June and July, 1901 to 1907, abundant on various *Salix*, most so on the goat willow; Chilham, 1900; Woodchurch, 1899.

Genus APHIS, Linnæus.

Aphis brassicæ, Linnæus.—Scattered all over the county, appearing mostly in late July and August, and often doing much harm.

A. crataegi, Kaltenbach.—Wye, Chilham, Whitstable, Canterbury, Linton, Dartford, Tonbridge, Sellinge, often abundant on the hawthorn hedges.

A. carotæ, Koch.—Wye, Paddock Wood, Canterbury, Horsmonden. On the roots and leaves of carrots. Walker's *A. subterranea* is evidently the same.

A. grossulariæ, Kaltenbach.—Maidstone, Wye, Sellinge, Faversham, Swanley, Orpington, Canterbury. Common on gooseberries and red currants, doing much harm.

A. mali, Fabricius.—A common pest in all Kent orchards.

A. fitchii, Sanderson.—Wye, Orpington, Swanley, Linton, Dartford, Newington, Sellinge, Hythe, &c. Common on apple; probably occurs everywhere.

A. pyrarica, Kalténbach.—Wye, very common and harmful in my garden.

A. cucurbiti, Buckton.—Wye, on marrows in August, 1910.

A. sorbi, Kalténbach. — Common in most districts, but especially so in the Marden area on apples, where it does much harm. Also on hawthorn. The red blistered and rolled leaves are most marked.

A. pruni Réaumur.—Common all over the county and often doing much harm to plums. I am almost certain this species also migrates to the hop.

A. hederæ, Kalténbach.—Occurs annually on ivy in my garden at Wye from July to September, and then disappears as a winged brood, first seen, 1901; Blackheath, June, 1906.

A. rumicis, Linnæus.—On docks and thistles all over the county. It is undoubtedly one form of the destructive bean aphid or black fly, *A. fabæ*, Kirby & Spence.

A. atriplicis, Linnæus.—Wye and Stour Valley in 1904. It occurred in vast swarms in July, and settled on hops, leeks, onions, beet, wild chenopodia, mangolds, cabbage, dahlias, &c., coating the leaves with masses of winged females, which at once produced living young. Soon after a fungoid disease swept them all off, but not before great damage was done. I have not seen the species since.

A. papaveris, Fabricius.—Wye, June and July. I have found this twice in my garden. One of the two dull olive-green aphides found in July, August, and September on asparagus is clearly the same.

A. sambuci, Linnæus.—Swanley, 1904, swarming on elder trees.

A. cardui, Linnæus.—Wye, Crundale, Sellinge, in August, on thistles.

A. sambucaria, Passerini.—Wye, 1900, 1901, 1907; Swanley, 1905. June and July, and then disappears. Forms dense black masses on the top shoots of the elder trees.

A. circumflexa, Buckton.—Lee, June, 1906, on salvias.

A. pyri, Boyer de Fonscolombe.—Wye, July, 1908; curling the leaves of pears and changing them to pale yellow or pale rich red.

Genus HYALOPTERUS, Koch.

Hyalopterus pruni, Fabricius.—Wye and district, Linton, Dartford. Probably all over the county. Undoubtedly the same as *H. arundinis*, Fabricius. I have followed the leaving of the latter from reeds (*Juncus*) and rushes (*Arundo*) to the plums. Mr. Willcocks tells me the same happens in Cairo. Quite harmful to plums in Worcester and Herefordshire and at Wye in 1903 and 1905.

Genus CAITOPHORUS, Koch.

Caitophorus aceris, Linnæus.—Wye, 1905 to present year, in abundance on sycamore in all stages. Seems to do but little harm even when swarming beneath the leaves.

Genus PTEROCOMMA, Buckton.

Pterocomma pilosa, Buckton.—Wye, with *Melanoranthus salicis*

in small numbers; Eynsford, 1898, on weeping willows; Canterbury, 1897, &c.

Genus *CALLIPTERUS*, Koch.

Callipterus coryli, Goetze.—Wye, Linton, June to October, on hazel and on cultivated cob and filbert nuts.

Genus *PTEROCALLIS*, Passerini.

Pterocallis juglandicola, Kaltenbach.—Wye, on walnuts, in 1894. Not seen since.

P. tilie, Linnæus.—Wye, Ashford, Canterbury, Tunbridge Wells, Ramsgate. Frequently in enormous numbers on limes.

Genus *PSYLLAPHIS*, Koch.

Psyllaphis fagi, Linnæus.—Wye, Kennington, Canterbury, Linton, on copper beech and common beech; sometimes harmful.

Genus *PTYCHODES*, Buckton.

Ptychodes juglandis, Finch.—Wye, in 1897, 1901, and 1907, on the upper surface of walnut leaves in swarms, but doing no apparent damage. One colony found in August, 1910.

Genus *LACHNUS*, Illiger.

Lachnus pinicolus, Kaltenbach.—Kennington, in 1904, East Peckham, on Scotch fir, 1906, July.

L. viminalis, Boyer de Fonscolombe.—Wye, in profusion in my garden and along railway on various *Salix* in 1904; some colonies eight inches long.

L. piceæ, Walker.—Wye, Kennington, 1901 and 1906, both years in July, and after August 7th in 1901, and August 20th, 1906, they all disappeared. On the silver fir and the spruce.

Genus *TRAMA*, Heyden.

Trama troglodytes, Heyden.—Wye, on the roots of sow-thistle and on lettuce, often common.

SCHIZONEURINÆ.

Genus *SCHIZONEURA*, Hartig.

Schizoneura lanigera, Hausman.—All over the county on apple, both root and stem forms occurring and doing much harm. Occasionally found on the pear and on wild crabs.

S. fuliginosa, Buckton.—Wye, in Olantigh Gardens, in 1908, in numbers on *Pinus sylvestris* from June to September. Not seen since.

S. ulmi, Linnæus.—Wye, Canterbury, Bearstead, Maidstone, Ashford, on elms.

S. fodiens, Buckton.—Wye, Bearstead, Swanley, Canterbury, Tenterden, Paddock Wood, Faversham, Maidstone, Longfield (1908). Common on currant roots. Buckton's *S. fodiens* on currant roots is one form of the leaf-curling elm *Schizoneura* mentioned above.

S. lanuginosa, Hartig.—Wye, Chartham, Ulcombe, Swanley, Ashford, Hothfield, Dartford, Canterbury, Petham. The large galls they form are often very abundant on the elms.

PEMPHIGINÆ.

Genus PEMPHIGUS, Hartig.

Pemphigus bursarius, Hartig.—Wye, Ulcombe, Ashford, Sittingbourne, on poplars. The galls are often very numerous.

P. spirothecæ, Koch.—Wye, 1901, 1907 to 1910, on poplars.

P. lactuarius, Passerini.—Wye, Paddock Wood, on roots of weeds and lettuce.

Genus TETRANEURA, Hartig.

Tetraneura ulmi, De Geer.—Old Romney, 1879 (Buckton); Bearstead, 1905; Wye, 1901 to 1910; very abundant and doing much harm to young elms, many killed by it. Some galls reached over one inch in length.

CHERMESINÆ.

Genus CHERMES, Linnæus.

Chermes corticalis, Kaltenbach.—Wye, on Scotch fir; Chartham and Hothfield.

C. abietis, Linnæus.—Common all over the county on spruce.

C. laricis, Hartig.—This form of the former is generally common on larch all over the county.

C. pini, Koch.—Wye, on *Pinus sylvestris*; Hothfield, 1900.

C. strobilobius.—Wye, common on spruce; Hothfield; Milton Chapel; Sevenoaks; Tonbridge; Appledore.

Genus PHYLLOXERA, Boyer de Fonscolombe.

Phylloxera quercus, Boyer de Fonscolombe.—Bearstead, 1906, smothering a small oak near railway station; Hastingleigh, on two small oaks, evidently very destructive; Wye, on two young oaks in a plantation, both killed by them.

RHIZOBIINÆ.

Genus FORDA, Heyden.

Forda formicaria, Heyden. — Beckenham (Lord Avebury in Buckton).

Genus TYCHEA, Passerini.

Tychea trivialis, Passerini.—Beckenham (from Buckton).

T. setulosa, Passerini.—Beckenham (Lord Avebury).

T. setariæ, Passerini.—Beckenham (Lord Avebury in Buckton).

T. eragrostidis, Buckton.—Beckenham (Lord Avebury in Buckton).

Genus ENDEIS, Koch.

Endeis pellucida, Buckton. — Beckenham (Lord Avebury in Buckton).

E. carnosa, Buckton.—Beckenham (Buckton).

RHYNCHOTA INDICA (HETEROPTERA).

BY W. L. DISTANT.

WITH vol. v. of my Rhynchotal portion of the 'Fauna of British India,' the Heteroptera, so far as that publication is concerned, must be considered as a completed subject. Fresh material, however, continues to reach my hands, and, as the Editor of this Magazine has offered me the hospitality of his pages, I propose from time to time to continue the description and enumeration of such species as have not previously been included in the fauna.

The Homoptera will be supplemented in another volume of the original work.

Fam. PENTATOMIDÆ.

Æliomorpha fletcheri, sp. n.

♂. Body and legs pale brownish-ochraceous; head punctate, the lateral margins strongly sinuate, central lobe prominent, depressed at apex; antennæ ochraceous, the second and third joints infusate, first joint short, not reaching apex of head, second very short and subobsolete, third slightly longer than either fourth or fifth, which are subequal in length; pronotum granulose, more distinctly so on basal half, a central narrow levigate line, the lateral margins sinuate, the lateral angles subprominent and broadly subacute; scutellum more or less wrinkled and finely punctate, a small pale levigate spot near each basal angle; corium thickly finely punctate, inner margin at apical area of scutellum narrowly blackish; membrane hyaline, distinctly passing abdominal apex; connexivum ochraceous with large segmental brownish spots; lateral areas of sternum and abdomen beneath thickly punctate; rostrum reaching posterior coxæ, its apex black. Long. 4 millim.

Hab. Ceylon; Hambantota (Bainbrigge Fletcher—Brit. Mus.).

This is the second species of the genus at present described from British India.

Halyomorpha illuminata, sp. n.

Ochraceous, more or less punctured with olivaceous-green or fuscous; head thickly olivaceously punctate, the margins moderately reflexed, the apex subtruncate, lateral lobes very slightly longer than the central lobe; antennæ blackish, basal joint ochraceous with an outer black line, first joint almost but not quite reaching apex of head, second shorter than third, third and fourth subequal in length, fifth a little longest with the base ochraceous; pronotum ochraceous, thickly olivaceously punctate, excepting a discal transverse ochraceous area between but not reaching the lateral angles, this area is almost impunctate, but usually contains two maculate clusters of dark punctures, extreme margins narrowly ochraceous, lateral angles sub-

prominent and broadly subangulate, lateral margins slightly reflexed; scutellum thickly darkly punctate, a levigate ochraceous spot at each basal angle, the apex stramineous with concolorous punctures; corium thickly but more finely darkly punctate; membrane passing the abdominal apex, pale fuliginous but reflecting the dark abdomen beneath; body beneath and legs pale ochraceous; two spots on each side of pro- and mesosterna, one on each side of metasternum, abdominal spiracles and elongate spots on lateral margins, spots on apical areas of femora, apical third of anterior tibiae, and apices of tarsi, black. Long. 14 millim. Exp. pronot. angl. 8 millim.

Hab. Travancore (G. S. Imray—Brit. Mus.).

Scylax porrectus, Dist., Trans. Ent. Soc. Lond. 1887, p. 345, pl. xii. f. 7; *id.*, Faun. Brit. Ind. Rhynch. i. p. 161, f. 97 (1902).

Since describing and figuring this species I have received, by the kindness of Dr. Montandon, a male specimen from Kurseong, Bengal.

♂. Smaller than female, the lateral lobes of the head somewhat widely separated before the apex of the central lobe as in the female; anal segment in male somewhat longly produced, on each side in a robust curved spine, these spines are laterally very broad, and are provided beneath, near base, with a small tooth projecting inwardly.

This effectually disposes of the contention of Breddin (Wien. Ent. Zeit. xxvi. p. 93 (1907)), repeated by Kirkaldy (Cat. Hem. (Heteropt.) i. p. 371, 1909), that *S. porrectus*, Dist., and *S. macrinus*, Dist., were the sexes of one species. As both these species were figured (Trans. Ent. Soc. Lond. 1887, pl. xii. figs. 7 and 9), where they can both be seen to be female specimens, the suggestion always appeared to me to be bizarre, but until I received the male of *porrectus* the refutation could therefore well be deferred.

Compastes taurus, sp. n.

Body above castaneous-brown; apex of scutellum, body beneath, and legs ochraceous; head coarsely darkly punctate, the lateral lobes divergent at their apices, lateral margins slightly sinuate, apex broadly rounded; antennae with the first and second joints ochraceous, mottled with brownish, third black, ochraceous at base (remainder mutilated in type), first joint not reaching apex of head, second slightly shorter than third; pronotum coarsely darkly punctate, the lateral angles broad, short, a little directed upwardly and forwardly, their apices trisinate, the anterior and posterior angles subacute, the lateral pronotal margins sparingly dentate, an obscure central pale levigate line, and between the lateral angles transversely subrugulose; scutellum more finely punctate and transversely wrinkled, the basal area moderately elevated; corium thickly, somewhat finely punctate; membrane bronzy brown, a little passing the abdominal apex, an obscure ochraceous spot at the outer basal angle; sternum

blackly punctate, orificial areas broadly blackish; abdomen beneath finely mottled with pale brownish, spiracles and linear marginal spots black; legs finely mottled with brownish; rostrum reaching the posterior coxæ, its apex black; mesosternum centrally sulcate. Long. ♀ 17 mm. Exp. pronot. angl. 11 millim.

Hab. Bengal; Kurseong.

The comparatively short, apically tricarinate lateral angles of the pronotum will distinguish this species. I received it through Dr. Montandon.

Prionaca nigrescens, sp. n.

Black, more or less mottled with ochraceous; head punctate, transversely wrinkled, with fine more or less distinct longitudinal carinate lines, the most prominent at the middle of the central lobe, the apex rounded, the lateral lobes very slightly longer than the central lobe and cleft at their apices; antennæ black, first joint not reaching apex of head, second longest, third and fourth subequal, the latter ochraceous at base; pronotum coarsely punctate and rugulose with scattered ochraceous mottlings, a central ochraceous line not reaching base, on each side of which is a levigate ochraceous spot, lateral angles robust, somewhat strongly, laterally, and a little upwardly produced, their apices shortly acute, their margins serrate, lateral pronotal margins shortly obtusely dentate; scutellum thickly punctate, three levigate ochraceous spots at base, one at each basal angle and the third central, the lateral and apical margins very narrowly and obscurely dull ochraceous; corium thickly punctate, a somewhat large irregular impunctate ochraceous spot a little behind middle of disk; membrane pale bronzy brown; connexivum pale testaceous, spotted with black; sternum black, greyishly tomentose, finely punctate; abdomen dull ochraceous, the spiracles and lateral marginal spots black; coxæ and femora ochraceous, apical areas of femora, and the whole of the tibiæ and tarsi, black; rostrum just reaching the posterior coxæ, its apex black; abdominal spine not extending beyond the posterior coxæ; sternum distinctly centrally sulcate. Long. ♂ $9\frac{1}{2}$, ♀ $10\frac{1}{2}$ millim. Exp. pronot. angl. ♂ 7, ♀ 8 millim.

Hab. Bengal; Kurseong.

For the possession of this species I have to thank my friend Dr. Montandon.

Fam. BERYTIDÆ.

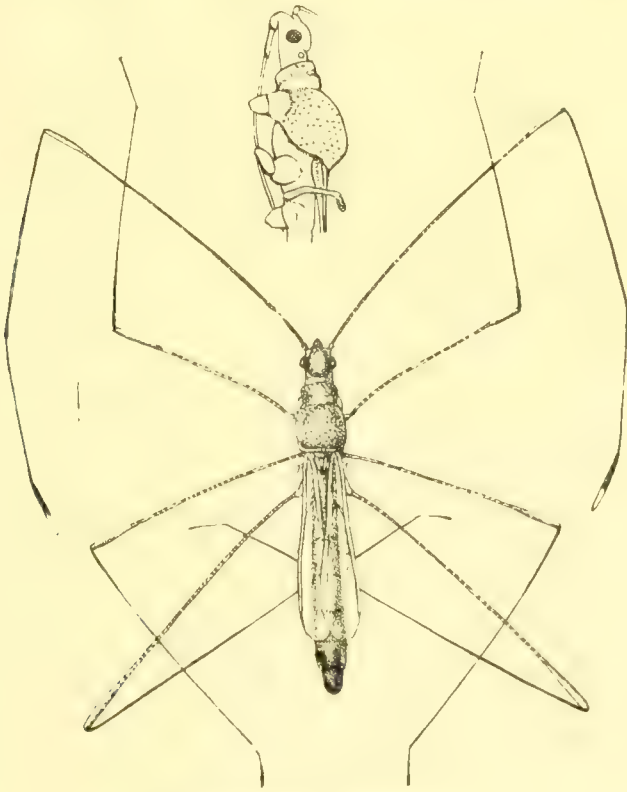
Genus TAPROBANUS, nov.

Body long and narrow; posterior femora passing apex of abdomen; hemelytra shorter than abdomen; head longer than broad, deflected and narrowed anteriorly, moderately globose; ocelli at a short distance from base, nearer lateral margins than to each other; eyes about midway between base and apex; antennæ with the first joint longest, a little shorter than the body, its apex slightly incrassated, second a little longer than third, fourth short and moderately incrassated; pronotum about one and a half times as long as head,

distinctly transversely impressed and narrowed at about one-third from anterior margin, remaining two-thirds moderately convex and distinctly declivous from base, the lateral margins a little rounded, basal margin truncate, anterior margin moderately convex; scutellum longer than broad; hemelytra extending to about the base of the penultimate abdominal segment; rostrum reaching the posterior coxæ, basal joint stoutest and reaching middle of head, legs long and slender, femora incrassated at apices, anterior legs with the tibiæ as long as femora, intermediate and posterior legs with the tibiæ distinctly longer than femora.

Taprobanus graveleyi, sp. n.

Shining ochraceous; apical joint of antennæ black, its apex white; head smooth, glabrous; eyes black; pronotum thickly coarsely punctate, the anterior area elevated, depressed interiorly, a little nodulose at middle of anterior margin, basal margin narrowly lami-



TAPROBANUS GRAVELEYI.

nate; hemelytra pale ochraceous, the corium a little darker; femora finely spotted with black, the incrassated apices pale testaceous, tibiæ and tarsi fuscous. Long. 7 millim.

Hab. Ceylon; Peradeniya (F. H. Graveley).

CAPYS MALACAIPUS (Faun. B. I. Rhynch. vol. iv. p. 490).

Capyella horni, Bredd. Deutsch. Ent. Zeitschr. 1907, p. 37.

NEW SPECIES OF HEMITHEINÆ (GEOMETRINÆ, Auctt.).

By LOUIS B. PROUT.

Agathia dimota, Prout, nov. sp.

♀. 42 mm. Structure and coloration of *pisina*, Butl., &c.; abdomen not appreciably crested, dorsally red-brown, with quite indistinct pale spots. Fore wing with the red-brown markings arranged as follows:—basal patch obliquely bounded, broadening *costad*; median band consisting of three large, well-separated spots, the middle (between M^1 and M^2) elongate distad, and scarcely entering the cell, hence appearing more out of alignment than in the other known forms, the inner-marginal spot trilobed, a rounded lobe standing between SM^2 and the fold, a rounded (proximal) and a smaller, less regular (distal) one between SM^2 and inner margin; sub-apical band consisting of an irregular blotch from the costal shade to R^2 , and a second one from R^3 , joining the terminal shade below M^1 ; terminal shade irregular in width, narrowing to a fine line about R^1 , forming two rather large triangles on R^2 and R^3 , and extending rather broadly along inner margin to a distance of about 4 mm. from tornus. Hind wing with the red-brown markings normally formed. Under side with the markings similar, but somewhat weaker and reduced in extent.

Fiji. Type in coll. L. B. Prout.

*Anisozyga** *vagilinea*, Prout, nov. sp.

♀. 40 mm. Face and occiput green; vertex white. Palpus rather slender, less long than in typical *Anisozyga*, hardly over $1\frac{1}{2}$, green, beneath white. Antenna on its dorsal (scaled) area white proximally, green distally. Thorax and abdomen green above, white beneath, abdomen with white anal end and white dorsal dots. Fore wing longer and narrower, and hind wing with costa longer than in typical *Anisozyga*. Colour rich deep bluish green, costa of fore wing pure white, lines yellow, very slender. Fore wing with ante-median line from costa near base to inner margin just beyond one-third, very oblique outwards, forming a tooth outwards in lower half of cell, broadly outcurved in submedian area, and again oblique outwards to inner margin; postmedian line from costa at three-fourths, dentate and zigzag, approaching termen at R^3 and M^1 , and to a less extent at M^2 , then running basad for some distance along that vein and sharply bent to run to inner margin at nearly three-fourths; termen with conspicuous pure white dots which extend into the fringe; fringe mostly dark grey, varied with reddish at tornus. Hind wing similar. Under side uniformly very pale green.

Fak-Fak, Dutch New Guinea, December, 1907 (A. E. Pratt). Type in coll. L. B. Prout.

Very close to *Anisozyga exililinea*, Warr., Nov. Zool. xiii. 89 (*Rhomborista*), differing in the possession of a white dot at the

* *Anisozyga* (Turn., MS.), Prout, nov. nom. = *Anisogamia*, Warr., Nov. Zool. iii. 286, nec Saussure. 1893.

base of fore wing, in the quite different inner line of both wings (strongly outcurved in submedian area) and especially in the shorter palpus. Both species are aberrant in shape and in having DC^3 of the hind wing not very oblique.

Rhomborista megaspilaria gibbosa, Prout, nov. subsp.

Like Guenée's type form except in the shape of the wings; fore wing with termen strongly bulged in middle, very oblique below, tornus sometimes considerably cut away; hind wing somewhat narrower than in the type.

Fak-Fak, Dutch New Guinea, 1700 ft., December, 1907. Type in coll. L. B. Prout.

Thalassodes eumixis, Prout, nov. sp.

♂. 40–43 mm. Extremely like *Th. albifusa*, Warr. Nov. Zool. iii. 293, of which I at first regarded it as a local race; but as I have learned that *albifusa* also occurs at Fak-Fak, I believe it will prove a separate species. Differs in its usually larger size* and restriction of the white markings; head nearly all green, only *very narrowly* white between the antennæ; antennal shaft with less white than in *albifusa*; wings with the white markings narrowed and a good deal dusted with green.

Fak-Fak, Dutch New Guinea, 1700 ft., December, 1907 (A. E. Pratt). Type and two other males in coll. L. B. Prout; others seen. Also from British New Guinea.

Thalassodes interalbata, Prout, nov. sp.

♂. 45 mm. Shape and structure normal, palpus with third joint quite moderate, hind tibia dilated with hair-pencil, termen of hind wing with elbow moderately pronounced. Face green: vertex and occiput white; palpus green, white beneath. Antenna ochreous, proximally white-scaled. Thorax and abdomen green above, white beneath. Fore leg ochreous, other legs whitish. Wings of the same green as *Th. albifusa*; fore wing with two broad white bands which are coarsely speckled with green in places, especially at their boundaries, hence rather ill-defined; the antemedian band from near base, reaching on costa to nearly one-fourth, on inner margin to nearly one-third; the postmedian occupying about one-half of the terminal third of wing, shading off into green (white-speckled) costally and distally; fringe concolorous with termen; no cell-spot. Hind wing with similar white bands; the first occupying the cell and approximately the inner-marginal one-third of wing, the margin itself narrowly green; second band continuing the postmedian of fore wing, running near the distal margin and terminating at R^3 ; fringe as in fore wing; no cell-spot. Under side similar, but much paler.

Fak-Fak, Dutch New Guinea, 1700 ft., January to February, 1908 (A. E. Pratt). Type in coll. L. B. Prout.

* I have seen one undersized example, no larger than average *albifusa*.

Closely related to *Th. albifusa*, Warr., differing chiefly in the broader white bands and absence of discal spots.

Antharmostes (?) *lunatimargo*, Prout, nov. sp.

♂. 32 mm. Face reddish mixed with fuscous (abraded), vertex narrowly pale ochreous brown, occiput, palpus and shaft of antenna red-brown. Thorax and base of abdomen dorsally concolorous with wings, dorsum of abdomen otherwise reddish brown mixed with pale ochreous brown; thorax and abdomen beneath pale ochreous brown; fore leg mixed with reddish. Wings blue-green, without lines; fore wing with costal margin red-brown, coarsely and irregularly marked with fuscous, becoming pale ochreous brown against SC; both wings with the termen narrowly of the same red-brown colour, preceded by a thick, lunulate pale line, and this again by an extremely fine dark line; terminal line fine, dark; fringe pale ochreous slightly marked with reddish. Under side very pale, dirty greenish, the margins with suggestions of the ornamentation of upper surface.

Near Baringa, Lulongo River, Congo, long. 21° E. (Rev. E. Cartwright). Type in coll. L. B. Prout, kindly presented by Mr. G. R. Baldock, F.E.S. A female from Lagos, July 30th, 1906 (G. L. Boag), much smaller and in inferior condition, in coll. Brit. Mus.

Will almost certainly require separating generically from *Antharmostes*, in spite of superficial resemblance; palpus in both sexes more slender, in male shorter, in female with third joint elongate, exposed; fore wing with $1r^1$ short-stalked with all five subcostals; hind wing with the angle at R^3 very slight, not produced into a tail; both wings with DC^3 very oblique below, as in *Agraptochlora*, &c.; female antenna pectinate.

Gelasma fuscifimbria, Prout, nov. sp.

♂. 44 mm. Face and palpus black, palpus light beneath; vertex and basal part of antennal shaft whitish, pectinations brownish grey, extreme back of head, with thorax dorsally, greenish grey (slightly discoloured), abdomen grey. Legs pale, fore leg fuscous-marked above. Wings glaucous grey, scarcely greenish, not iridescent. Fore wing with the lines pale, rather indistinct; antemedian slender, waved, from nearly one-fourth costa to one-third inner margin, very faintly dark-shaded distally; postmedian from nearly two-thirds costa to two-thirds inner margin, lunulate-dentate (the teeth pointing outwards on veins, the deepest lunule between M^2 and SM^2), very faintly dark-shaded proximally; an indistinct elongate, slightly curved, dark cell-mark; fringe concolorous distally, slightly darker proximally. Hind wing similar, without the antemedian line. Under side uniform dirty whitish, the fringes fuscous.

Khasis. Type in coll. L. B. Prout. Three females (somewhat smaller) in coll. Swinhoe.

Rather near *G. sublustris*, Warr., Nov. Zool. vi. 24, but larger and greyer, lines less clear white, discal marks dark, not

whitish; also in structure, the third palpal joint is less long and slender than in the male of that species.

Seems to have been confounded with *glaucaria*, Walk., from which the larger size, somewhat darker colour, blackish palpus and dark fringe beneath readily distinguish it.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Continued from vol. xliii. p. 349.)

Perizoma taiwana, sp. n.

Fore wings with a blackish basal patch and medial band, outer edge of the former and the inner of the latter white, space between patch and band ochreous brown clouded with darker brown; the black outer edge of medial band is slightly angled near costa, and bidentate at middle, followed by a narrow white band outwardly tinged with ochreous brown; the area beyond is brownish, with a large irrorated white spot between veins three and five, some black bars above the spot and some black scales below it; submarginal line formed of white dots, more or less connected towards the costa; fringes pale brown, marked with darker. Hind wings whitish, fuscous tinged.

Expanse, 26 millim.

Collection number, 824.

A female specimen from Arizan (7300 ft.), September 15th, 1906.

Perizoma simulata, sp. n.

♂. Fore wings whitish, flecked with pale brownish; basal patch and medial band blackish brown, the middle of the latter strongly bidentate; apical fourth of costa blackish; submarginal line represented by five white dots towards the costa, the fourth preceded by a blackish bar; a blackish discal mark; fringes chequered with blackish brown. Hind wings whitish, outer margin fuscous tinged. Under side of the fore wings fuscous, ochreous tinged; the markings of upper side faintly showing, the five submarginal spots clearly defined; of the hind wings pale fuscous, mottled with darker; a black discal spot, a whitish postmedial line, and a submarginal series of white dots.

Expanse, 19 millim.

Collection number, 827.

One male specimen from Arizan (7300 ft.), September 26th, 1906.

Allied to *P. decorata*, Moore, from Sikkim. Some specimens, also from Sikkim, in the British Museum Collection, seem to be identical with the Formosan insect now described.

Anisodes taiwana, sp. n.

♂. Whitish ochreous, irrorated with ochreous brown. Fore wings have four purplish transverse lines; the first line wavy, indistinct; the second line slightly angled and indistinct above the darker discoidal mark; the third line dentate, appearing to terminate in a purplish cloud about the middle of the wing; the fourth line slender, wavy, dotted with black; a purplish loop from fourth line, between veins five to six on the outer marginal area; black marginal dots at the ends of the veins. Hind wings have four lines somewhat similar to those of fore wings, but the first is even less distinct; outer margin dotted with black.

Expanse, 30 millim.

Collection number, 869.

A male specimen from Kanshirei (1000 ft.), April 28th, 1908.

Nearly allied to *A. heydena*, Swinhoe.

Callerrinnys rufolimbata, sp. n.

Orange-yellow, sprinkled with brown scales; outer area of all wings, beyond the dark brown postmedial line, purplish brown, enclosing a patch of the ground colour. Fore wings have a black discal dot; antemedial line dark brown, curved, indented near costa and again towards inner margin; on the hind wings the antemedial line is angled near costa and at middle. Fringes orange-yellow, chequered with brown.

Expanse, ♂ 28 millim., ♀ 32 millim.

Collection number, 637.

A male specimen from Kanshirei (1000 ft.), August 20th, 1905, and a female from Suisha Taisar (3000-4000 ft.?), July 13th, 1908.

There are two examples of this species from Ceylon and one from the Andamans in the British Museum.

Thyatira albipuncta, sp. n.

Head and thorax brown, collar and crest tipped with chestnut. Fore wings brown shaded with darker; a pinkish brown patch on basal fourth of costal area, enclosing a brown linear spot on the costa; a conspicuous white subbasal spot below the median nervure; stigmata slightly darker but not distinct; antemedial line blackish, wavy, indented below costa, inwardly edged with whitish; postmedial line black, double, enclosing a white thread, originating in a pinkish brown patch on the costa, outwardly edged with red from vein three to dorsum; three or four other wavy, dusky lines between the ante- and postmedial lines, all most distinct on the costa; subterminal line whitish, marked and interrupted with blackish, wavy; an oblique whitish cloud from apex to postmedial line; venation barred with chestnut on outer margin, each bar terminating in a black V on the margin. Hind wings dark fuscous.

Expanse, 40 millim.

Collection number, 917.

The type—a male from Formosa—is in the British Museum Collection. I have two specimens from Arizan (7000 ft.), taken in July, 1909.

Trisuloides subflava, sp. n.

♂. Head and collar white, the latter edged in front and spotted with black; thorax brownish mixed with white; abdomen yellowish towards base, remainder greyish, dorsal tufts blackish. Fore wings blackish grey, sprinkled with white and tinged with brown on the outer margin; a white patch at base enclosing short black basal and interrupted subbasal lines; a small white spot in the cell, and a larger one at end of cell, the latter enclosing a black grey mark, extends to postmedial line; antemedial line black, preceded by a black mark on the costa, deeply indented about middle and again before the inner margin; postmedial line black, sharply angled below costa, curved beyond cell, and obtusely angled before the inner margin; submarginal line black, irregularly serrate, followed by some small white spots; marginal line whitish, wavy. Hind wings yellow, outer margin narrowly brownish. Under side yellow, outer margin broadly dusky limited by blackish lines; fore wings have a blackish cloud at end of the cell, and a dusky shade below; hind wings have the median third whitish from the costa to vein three.

Expanse, 55 millim.

Collection number, 1769.

One male specimen from Rantaizan (7500 ft.), May 14th, 1909.

There are unnamed specimens from Omeishan, China, and Khasia, in the British Museum.

Deilemera albofasciata, sp. n.

♀. Head, thorax, and abdomen yellow marked with black, as in *D. arcata*, Walk. Fore wings blackish grey; a white longitudinal line from the base under median nervure, the outer end squared, a blackish dot on it near base; a white, oblique postmedial band, the inner edge indented deeply, between veins two and three, the outer edge dentate; a blackish grey mark on the band between veins five and six; white marginal spots at ends of the veins, the fourth and fifth larger, connected with postmedial band by white scales along veins three and four. Hind wings white, with eight black spots on outer margin, sixth and eighth largest; fringes white, marked with black between veins four and five.

Expanse, 54 millim.

The type—a female—from Kagi district (7000 ft.), Formosa, in the British Museum Collection.

Deilemera fractifascia, sp. n.

Head white, a black spot on crown; thorax white with ten black spots; abdomen white spotted with black on the anterior segments, and banded with black on the posterior segments. Fore wings greyish brown; a short white streak from base under median nervure, enclosing a spot of the ground colour near base; two white marks on the costa, one near base, the other at about one-fourth from base; a

postmedial series of five white spots, the fourth much smaller than the others; a white dot just below origin of vein two, and another just above middle of the inner margin; an elongate white spot above the inner angle, and a white subapical dot. Hind wings white, a rather broad greyish brown border on outer margin, in which are two white spots—one at middle and the other towards costa.

Expanse, 52 millim.

Collection number, 1216.

One male specimen from Kanshirei (1000 ft.), May 2nd, 1908; another example of the same sex from Poppawnia, Suisha (3000–4000 ft.?), July 14th, 1908.

(To be continued.)

NOTES BY THE WAY.

WE all have a soft spot in our heart for that curious little book over which we spilt “treacle” years ago, ‘The Butterfly Collector’s Vade Mecum’; but how few of us know aught of the author! Recently we were delighted to stumble across a short notice of her under one of her poems in a somewhat rare book, ‘The New Suffolk Garland,’ compiled by John Glyde in 1866. It runs thus: “LÆTITIA JERMYN (1788–1848), second daughter of George Jermy, at an early age evinced a taste for poetry and general literature, and her graceful writings appeared in many periodicals of the day. She was born at Ipswich, October 8, 1788, and was married in 1830 to the Rev. James Ford, Fellow of Trinity College, Oxon, and Vicar of Navestock, whose topographical and antiquarian researches she materially aided during an engagement of twenty years, and to whose well-stored mind he constantly referred in all his literary pursuits. Possessing unusual conversational powers and sparkling wit, combined with a lively manner and great personal attractions, she was an ornament to the society in which she moved. Her love of nature led her to the study of entomology. She published, in 1827, ‘The Butterfly Collector’s Vade Mecum,’ dedicated to the Rev. William Kirby. She was a good botanist, and a knowledge of conchology also ranked among her many attainments. She died at the Vicarage, Navestock, after a short illness, July 15, 1848.” The English is shaky, but concise.

One is set wondering what percentage of the books upon entomology never find notice in the periodical scientific literature of Britain by casually picking up in an hotel in Southwold last September an odd copy of ‘The Athenæum,’ and finding, under the head of “Science,” reviews of two United States books upon ants. These are, ‘Ant Communities and How they are

Governed,' by H. Christopher McCook, published by Harper Brothers, in which the learned doctor appears to regard the constitutional monarchy of the queen ant as susceptible to human laws and explanations as that of Portugal, though his personal observations, and especially those in the Alleghany Mountains, are of an unusually close nature. The other is 'Ants: their Structure, Development, and Behaviour,' by William Norton Wheeler, published by the Columbia University Press in New York; and here we have egotistical wisdom—such wisdom as would consign the knowledge of the Ven. William Kirby in the Seventh Bridgewater Treatise "to the theological dustbin" (they are well worth resuscitating), and refers to "scholastic writers, like the Jesuit Wasman," whom he accuses of allowing his views on instinct to be governed by a zeal to "save one of the old Thomistic dogmas." Both books are evidently worthy of perusal.

We hasten to congratulate Percy H. Grimshaw upon being entrusted by Messrs. Lovell, Reeve and Co. with the preparation of a work upon the British Diptera, upon the lines of Canon Fowler's 'Coleoptera of the British Isles' and others of the same series, to run to some five volumes. We are informed that the first volume will contain the Cecidomyidæ, Mycetophilidæ, Bibionidæ, Simuliidæ, Chironomidæ, &c., and that the author is anxious to amass at once material for the first family from all parts of the country—galls, larvæ, and imagines—since the distribution of these interesting gnats is an important feature. There certainly is room for a work of intermediate nature between the beautiful and ponderous tomes emanating all too slowly from the doyen of the Entomological Club, and the mere analytical tables of Rev. W. J. Wingate, published by Williams and Norgate in 1906, though most useful in their sphere. We also learn that Mr. H. J. Charbonnier, of Shepton Mallet, is preparing his collection of Diptera for generous presentation to the Taunton Museum.

The other day we picked up for a song another link with a bygone entomologist. This is the 'Bohemian Poems, Ancient and Modern,' of A. H. Wratislaw, M.A., Fellow and Tutor of Christ's College, Cambridge, well known to most corresponding lepidopterists fifty years ago, who wrote upon "Entomology in Suffolk" in the Trans. Suff. Archæolog. Soc. 1870, pp. 219–222, and "Reminiscences of Entomology in Suffolk" in E. M. M. 1880, p. 86, &c. This volume shows him in a new light to us; that he was Head of Bury St. Edmunds School we knew, but that he himself came of an old Bohemian family, of kindred race with the Count Valerian Krasinski, to whom the volume is dedicated, and attained such beauty of translated and original verse as is

displayed in this book, published by J. W. Parker, West Strand, in 1849, we had no idea.

We have just been enjoying the very capital cinematographic *Dytiscus* and its larva, at the New Egyptian Hall, in Piccadilly. The record of each movement is thrilling; and we hope the idea may be extended to other orders of insects.

C. M.

NOTES AND OBSERVATIONS.

UNUSUAL PAIRING OF MOTHS.—It may be of interest to record the capture in the Norfolk Broads, on August 12th last, of a male *N. brevilinea* paired with a female *L. impura*. The female laid a nice batch of ova in a reed stem, but unfortunately these failed to hatch.—R. GEOFFREY TODD; The Limes, Hadley Green, Barnet, December 16th, 1910.

SYNTOMIS RUBICUNDA.—This African moth was originally described by Mabille in 1892 (Ann. Soc. Ent. France; Bull. p. cxxxix.), but was redescribed and figured by Mabille and Vuillot in 1895. Hampson, who examined the type, has treated it as a synonym of *S. leucerythra*, Holland, 1893, being evidently aware only of the 1895 description. The object of this note is to point out that *rubicunda* was really published first, and is the valid name.—T. D. A. COCKERELL.

SMERINTHUS OCELLATUS IN THE NORTH SEA.—A friend has just handed me a specimen of *Smerinthus ocellatus* which alighted, on June 12th last, on a steamer in the North Sea, about one hundred and fifty miles south-west of Esberg in Denmark. My friend tells me that he kept it alive for two days on sugar and water, but it was evidently too exhausted to recover. This appears to me to be interesting as, so far as I know, the migratory instincts of this species have been but little recorded.—A. H. JONES; Shrublands, Eltham, December 9th, 1910.

CAPTURES AND FIELD REPORTS.

MACARIA LITURATA var. NIGROFULVATA IN NORTH LANCASHIRE.—I took a larva of this interesting variety from Scotch fir, in Low Wood, Holker, September 12th, 1909. The moth emerged in June, 1910, and is identical with Cheshire (Delamere Forest) specimens.—T. BAYNES; 70, Sunderland Terrace, Ulverston, N. Lancashire.

XYLOPHASIA ZOLLIKOFEI IN BRITAIN, 1910.—I beg to record the capture of a male specimen of *X. zollikoferi* at Methley on August 12th, 1910. It was shaken out of a bunch of withered leaves. I sent it to G. T. Porritt, Esq., of Huddersfield, who has identified it for me. He also informs me that it is in better condition than the other three recorded British specimens he has seen.—JOHN T. WIGIN; Methley, Leeds, December 10th, 1910.

UNRECORDED OCCURRENCES OF *VANESSA ANTIOPA*.—As it is always of interest to note the appearance of *V. antiopa* in this country, owing to the migratory habits of this species, I place on record two specimens (both of which I have lately added to my series of British caught examples) that were captured by a lady in her garden, one at Southchurch, Essex, in September, 1880, and the other in a conservatory in her garden at Rayleigh, Essex, in August, 1901. Also Mr. R. C. Banks informs me that on September 1st, 1909, while shooting with a friend near Abergavenny, Monmouthshire, they saw a fine specimen of this butterfly sunning itself on a gate post within two or three feet of them.—F. W. FROHAWK; November, 1910.

SIREX GIGAS.—From time to time I see the capture of *Sirex gigas* recorded in this journal; it would seem, therefore, that the captors consider it a rare insect in this country. I should like to remark that in my experience I find it appears to be not only quite a common species, but very widely distributed, as I have during many years past received numbers for identification every year, from July to October, from various localities throughout the British Isles, and in many instances my correspondents remark on the number of specimens met with.—F. W. FROHAWK; November, 1910.

CAPTURES AT LIGHT IN ISLE OF WIGHT.—*Pacilocampa populi* and *Asteroscopus sphinx (cassinea)* are both common at lamps in the island, this month.—G. NOBBS; North Lodge, East Cowes, Isle of Wight, December, 1910.

NOTES FROM HASLEMERE FOR 1910.—The first record in my notebook worthy of mention is under the date of March 25th, when a search of tree trunks and among the undergrowth of a copse yielded *Polyplocia flavicornis*, *Xylocampa areola*, *Xylina ornithopus*, *Teniocampa pulverulenta*, *Phigalia pedaria*, and *Tephrosia bistortata*. The lamps were visited with the usual results, the most noteworthy feature during the latter part of March and the first week of April being the great profusion of *Amphidasys strataria*. On several nights between April 21st and May 12th good results were obtained by searching for larvæ among the willows, birches, hazels, alders and bilberry, the insects which emerged therefrom being:—*Noctua festiva*, June 12th, a nicely varied series; *Boarmia repandata*, June 12th, very fine; *N. brunnea*, June 15th; *Aplecta nebulosa*, June 18th; *N. triangulum*, June 18th; *N. ditrapezium*, June 22nd, a very fine and varied lot, including one interesting variety, where the black markings are almost entirely absent, being merged in the ground colour of the wings; *Triphaena fimbria*, July 4th, in great variety; *N. baja*, July 7th; *T. ianthina*, July 7th; *T. comes*, July 15th, and sundry parasitic flies of different kinds. On April 27th I found a very fine female *Saturnia pavonia* sunning herself on the top of a tuft of heather, and I was successful in taking a good number of males by "assembling" with her. From May 10th onward *Euchloë cardamines* was unusually plentiful, and the ova were to be found in great numbers on garlic mustard; from May 14th *Cyaniris argioides* was out in profusion, and the second brood appeared to be equally in evidence

both in Hampshire and in Cornwall where I happened to be in August. On May 24th large numbers of *Callophrys rubi* were observed, and I obtained a few ova on the 27th which were deposited on young laburnum shoots. The resultant larvæ emerged on June 4th, and fed up very quickly on broom flowers (as far as I could see entirely refusing to eat any leaves), and the majority had pupated by July 5th. On June 3rd I took a fine female *Eustroma siluceata* at a lamp and she obliged with sixteen ova, all of which produced fine imagines. The young larvæ appeared on June 10th, began to pupate on July 3rd, and the imagines came out between July 21st and 27th. We had a series of stormy nights between June 5th and 9th with wind and thunder and lightning, but the lamps were swarming with moths all the time, including *Stauropus fagi*, *Drymonia trimacula*, *Notodonta trepida*, and other prominents, *Demas coryli*, *Xylophasia rurea*, with the variety *combusta*, *Dianthæcia carpophaga*, and a fine series of *Emmelesia albulata*, as well as swarms of common things. On June 10th a female *Parasemia plantaginis* was taken from long grass. She deposited twenty-seven ova, and the resultant larvæ fed up well on plantain, though a few died off at each moult. The first pupa appeared on September 15th and produced an imago on October 26th. All the survivors had pupated by October 9th, except one, which is still a small larva, and has curled up for the winter. Four imagines have appeared up to date, the last one on November 18th. On June 12th the lamps were swarming with moths, with *Dasychira pudibunda* and *Gonodontis bidentata* predominating; but *Drepana binaria*, *D. falcataria*, *Boarmia consortaria*, *Eupithecia oblongata*, *Chloroclystis rectangulata*, *Cidaria corylata*, and others were also taken. On June 22nd, which was a windy day, though the sun was shining brightly, a fine series of *Cænonympha pamphilus* was netted, the females being especially large.

Sugar, on the whole, was disappointing throughout the season, but on June 27th *Acronycta megacephala* and *Hadena genistæ* were taken, and on July 5th a nice series of *Mania typica*. On July 8th, a dark, damp night, *Lithosia lurideola* was taken from a lamp, and on the 11th *Hygrochroa syringaria*, *Cidaria picata*, and *C. associata*, with *Acidalia virgularia* on the 12th. On the 13th a fine specimen of *Limenitis sibylla* was seen, but not captured, and an interesting example of protective resemblance observed in a pair of young night-jars, to a large stone on the ground. The mother was seen flying around in an agitated manner, so we knew we must be too near her young to please her; but it was a long time before they could be found. On July 16th a female *Augiades sylvanus* was seen ovipositing and a few ova were obtained as she left them. The larvæ therefrom came out on August 2nd, and went on feeding till about the end of October, when they retired into their tents for the winter. On July 20th *Acronycta leporina* was taken from a lamp. I was away from home during August, and the next entry in my diary is for September 5th when *Tapinostola fulva* was taken from a lamp—my first record for this insect in Haslemere. From September 17th to October 1st I spent a good deal of time beating the birches, and was rewarded with larvæ of *Pheosia dictæoides*, *Notodonta dromedarius*, *Lophopteryx camelina*, *Cymatophora fluctuosa*, *Acronycta*

leporina, in fair numbers, as well as many *Hylophila prasinana*, *Drepana lacertinaria*, *Dasychira pudibunda*, *Phalera bucephala* and many geometers. On September 30th *Geortyna flavago* was taken at a lamp and deposited ova in the pill-box on the way home; and on October 27th a fair number of male *Parcilocampa populi* were taken.

Thus it will be seen that during 1910 the lamps were unusually productive and the sugar very disappointing; and I regard the sallow searching in the spring and the beating of the birches in the autumn as my best work for the year.—F. A. OLDAKER, M.A., F.E.S.; The Red House, Haslemere, November 22nd, 1910.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, November 16th, 1910.*—Dr. F. A. Dixey, M.A., M.D., F.R.S., President, in the chair.—It was announced that the Council had nominated the following Fellows to act as officers for 1911:—President, Mr. J. W. Tutt; Treasurer, Mr. A. H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and the Rev. G. Wheeler, M.A.; Librarian, Mr. G. C. Champion, F.Z.S., A.L.S.; and as other members of the Council Mr. R. Adkin, Professor T. Hudson Beare, B.Sc., F.R.S.E.; Mr. G. T. Bethune-Baker, F.Z.S.; Dr. M. Burr, D.Sc., F.L.S., F.Z.S.; Mr. H. St. J. Donisthorpe, F.Z.S.; Mr. J. H. Durrant; Professor Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Mr. A. Sich, Mr. J. R. le B. Tomlin, M.A., and Mr. H. J. Turner.—The President having stated that the Royal Society were about to present the Darwin Medal to Mr. Roland Trimen, M.A., F.R.S., a Past-President of the Society, it was agreed unanimously to convey to the recipient the hearty congratulations of the Entomological Society of London.—Dr. Geoffrey Douglas Hale Carpenter, M.A., M.B., Uganda Medical Service, Uganda Protectorate; Mr. William B. Gurney, Assistant, Government Entomological Department of Agriculture, Sydney, N.S.W.; and Mr. J. C. Hawkshaw, Hollycombe, Liphook, Sussex, were elected Fellows of the Society.—The Hon. N. C. Rothschild brought for exhibition some examples of a rare Noctuid moth, *Oxytripia orbiculosa*, Esp., collected by himself and Miss Sarolta von Wertheimstein, at Pusztá Peszer, in Hungary, during the first week of October of this year, where examples of both sexes were secured.—The exhibitor made some remarks on the curious habits of the moth, illustrated by photographs of one of the sandy spots in the wood it frequents, and recalled the adventurous history of its discovery and re-discovery in Hungary. He also showed examples of two species of flea, *Ctenocephalus canis* (dog-flea) and *Ctenocephalus felis* (cat-flea), and stated that, though still frequently considered to be identical, they were really quite distinct species. The exhibitor also remarked that the two had been united by Dr. Taschenberg under the name of *serraticeps*, a name which most certainly could not be retained.—Dr. G. Nicholson showed the example of *Lathrobium longipenne*, Fairm., taken by him at Croydon, in May, 1910, of which a specimen was exhibited by Commander J. J. Walker, at the last meeting of the

Society.—Professor T. Hudson Beare exhibited specimens of three species of beetles, all taken abundantly by him at Nethy Bridge, Inverness-shire, during July and August, 1910, viz. *Erirrhinus æthiops*, F., occurring in great abundance in a mere handful of flood refuse on the banks of the River Spey; *Criocephalus rusticus*, taken in numbers in the stumps of, and in small standing, Scots fir-trees on ground swept over by a forest fire some few years ago (there was no doubt that the larvæ had a preference for this burnt timber); and *Zeugophora turneri*, Pow., beaten in great profusion from aspens growing near Loch an-Eilan.—Mr. W. C. Crawley exhibited a colony of the ant *Lasius niger*, which had accepted as queen a female of *L. umbratus*, in 1908. Up to this autumn the only ants which had come to maturity in the nest were pure *L. niger*, thus confirming Reichenbach's experiments that *L. niger* hermaphrodites are able to produce hermaphrodites parthenogenetically. In connection with this exhibit Mr. H. St. J. Donisthorpe showed males, winged and wingless females, and hermaphrodites of *L. niger* and *L. umbratus* for comparison. He remarked that Father Wasman had recorded *umbratus* with *niger*, and that it is probable that *L. umbratus* female, being unable to found her own nests, is a temporary social parasite on *niger*. Mr. Donisthorpe also exhibited males, winged and wingless females, and hermaphrodites of *L. fuliginosus*, and pointed out that it was now proved that the females of this ant often founded their colonies with *umbratus*.—Mr. W. J. Kaye exhibited specimens of *Eucides pavana* (Heliconidæ), *Actinote thalia* (Acræidæ), and *Dismorphia actinote* from S. Brazil. Comment was made as to the very close resemblance between the first two. The resemblance was greatest on the under side, but the upper side also showed considerable convergence of colouring. The specimen of *E. pavana* exhibited had been caught and papered by Mr. Kaye as an example of the common *Actinote thalia*. The *Dismorphia*, while only a partial approach to the *Actinote* on the upper side, was extremely close on the under side, with the hind wing brought well over the fore wing in an attitude of rest.—Mr. L. W. Newman exhibited aberrant examples of *Abraxas grossulariata*; he also showed an interesting *Lycæna*, suggested to be a natural hybrid between *Agriades thetis* (*bellargus*) male \times *Polyommatus icarus* female, taken wild near Folkestone, the under side showing both *thetis* and *icarus* characteristics, with those of *icarus* most pronounced, the upper side a fine *thetis* colour with white fringes, the shape of wings being also curious, rather suggesting *A. coridon* as being the male parent.—Mr. G. T. Bethune-Baker, having examined this exhibit, gave it as his opinion that the supposed hybrid was merely an aberrant form of *Polyommatus icarus*.—Mr. Philip J. Barraud brought for exhibition a case containing several series of a large form of *Satyrus statilius* from the Aurunci Mountains, Southern-Central Italy; series of *Parnassius mnemosyne* var. *frühstoferi*, from Mount Petrella, Aurunci Mountains, 9000 ft.; series of *Colias edusa* and ab. *helice*, from Formia; very small specimen of *Gonopteryx cleopatra*, measuring 37 mm., from Formia; and four examples of a large form of *Pamphila comma* from Southern-Central Italy.—Dr. T. A. Chapman, M.D., F.Z.S., read a paper "On the Early Stages of *Latiorina* (*Lycæna*)

orbitulus, Prun., an Amyrmecophelous Plebeiid Butterfly," and "On the Larva of *Orgyia splendida*, Rbr. (*dubia*)."—Mr. Edward A. Cockayne communicated "Notes on Insect Enemies in the Tropics, and their Influence on Mimicry."—Professor Christopher Aurivillius, Hon. F.E.S., communicated a paper entitled "New Genera and Species of Striphnopterygidæ, and Lasiocampidæ."

Wednesday, December 7th, 1910.—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair.—Mr. R. Stewart McDougall, M.A., D.Sc., F.R.S.E., of Edinburgh University; and Mr. Hugh Frederick Stoneham, Lieutenant East Surrey Regiment, of "Kingswear," Streatham Park, S.W., were elected Fellows of the Society.—A letter of congratulation to Mr. Roland Trimen, F.R.S., from the Entomological Society of London, on the occasion of the award to him of the Royal Society's Darwin Medal, was read and approved.—The Vice-President announced that he had received from Dr. A. Feynes, a Fellow recently elected, and exhibited on his behalf, four boxes containing an admirable collection of North American Aleocharine Coleoptera, which the donor had offered most kindly to the Society. In the absence of any collections belonging exclusively to the Entomological Society of London, however, he had asked Dr. Feynes to authorize a transfer of the gift to the British Museum (Natural History), and he, therefore, with the consent of the meeting, handed it over to Mr. G. J. Arrow for that purpose.—Mr. H. W. Andrews exhibited a short series of *Carphotricha guttularis*, Mg., a scarce Trypetid, taken at Milford Haven in July last, and a specimen of a unicolorous form of *Prosenia sybarita*, F., from North Kent, July 30th, 1910.—Commander J. J. Walker exhibited specimens, communicated by Mr. J. N. Halbert, of *Syagrius intrudens*, Wat., an Australian weevil, which had been introduced into a fernery at Glasnevin, Co. Dublin, where it had done considerable damage; also of *Conops signata*, Wiedemann, male and female, a Dipteron new to Britain, taken at Tubney, Berks, September 11th, 1910, and exhibited on behalf of the captor, Mr. Joseph Collins, of the Oxford University Museum.—Mr. E. C. Bedwell brought for exhibition examples of *Bruchus pectinicornis*, L., a beetle usually looked upon as introduced into this country in granaries, but in this case swept on an open hillside at Chipstead, Surrey; also a variety of *Badister bipustulatus*, F., the usual black patches on the elytra being reduced to two small black dots.—Mr. W. C. Crawley showed, with normal examples, a brachypterous female of the ant *Lasius flavus*, found at Oddington, near Oxford, in August, 1900, at which locality, about the same time, were observed females of *L. niger* with short wings. Mr. H. St. J. Donisthorpe remarked that Mrázek had recently shown that the short wings of *L. alienus* were caused by the ant being infested by a Nematode worm of the genus *Mermis*, and that Wheeler had found this to be the case with short-winged females of *L. neoniger* in America. He now exhibited a short-winged male of *Technomyrmex albipes*, Smith, together with an ordinary-winged male which he had recently taken at Kew, and suggested that the former might be caused in the same way; also ergatoid males of the same species, taken at the same time, and two forms of *Prenolepis braueri*, sub sp. *donisthorpei*, Forel, taken at Kew: a black form, hermaphrodites and

male, taken in the Fern House, and a red form, hermaphrodites, from the Palm House.—Mr. H. M. Edelsten exhibited series of the following rare British Heterocera, viz. (a) *Dianthorcia luteago* var. *barrettii*, bred 1910, from Devon larvæ; (b) *Tapinostola extrema*, from Northamptonshire larvæ, July, 1910; (c) *T. hellmanni*, from larvæ taken in Wicken Fen, June, 1910; and (d) a pale variety of *Meliana flammea*, from larvæ collected in the Norfolk Broads, with a type-specimen for comparison.—Mr. H. Rowland-Brown exhibited, together with typical examples for comparison, two fine melanic variations of *Melitea parthenie*, Bork., one of which resembled ab. *rhoio*, Oberthür (Lépid. Comparée, fasc. iv.), taken at 2800 ft. at Clelles, Isère, last July; and also two very remarkable black aberrations of *M. varia*, taken by him in company with Mr. C. J. Johnson, in 1907, at the top of the Simplon Pass.—Mr. H. C. J. Druce brought for exhibition a Nymphaline butterfly from the Himalayas, *Parhestina jermyni*, n. sp., with *Aporia agathon* var. *phryxæ*, the Pierid it mimics closely—the subject of a paper read by him.—Mr. H. St. J. Donisthorpe, F.Z.S., read a paper entitled “Further Observations on Temporary Social Parasitism and Slavery in Ants.”—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on “Two New Species of *Lycænopsis* from Sarawak, Borneo.”—M. Ernest Olivier communicated a paper entitled “Description of Two New Species of *Luciola* in the Collection of Mr. H. E. Andrewes.”—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Oct. 13th, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. West (Greenwich) exhibited a series of the Homopteron, *Linotettix stictogala*, beaten from tamarisk at Deal. It was gradually extending its range.—Mr. Colthrup, the nest of the Reed Warbler, suspended among a bunch of reeds.—Mr. Tonge, photographs of the young larvæ of *Celastrina argiolus* attacking ivy buds, and *Vanessa io* and *Pyrameis atalanta* at rest.—Mr. Newman, melanic example of *Bryophila perla* taken at Folkestone, a suffused pink specimen of *Anthrocera trifolii*, an example of *Spilosoma menthastri* with joined up spots approaching var. *walkeri*, several *Abraxas grossulariata*: (1) black markings especially wanting on all wings; (2) yellow marking much increased in area and black decreased, and (3) a very dark specimen, the black areas united and enlarged.—Mr. Adkin, a series of *Cossus ligniperda* from Lewisham, and read notes on the occurrence and pupation of the species.—Mr. Turner, living bred examples of *Lyonetia clerkella* and its mine in a birch leaf with the swung silken cradle in which the larva turned to pupa.—Mr. Moore, a variety of *Limnas chrysippus* var. *alcippus*, in which the apical white dot is duplicated, and *Acrea encedon* ab. *alcippina* from the same locality, Northern Nigeria.—Mr. Main, newly hatched larvæ of the glow-worm.—Dr. Hodgson, an example of *Callophrys rubi* with xanthic areas on the disc of all the wings, specimens of *Nemeobius lucina*: (1) a female in which the yellow area was much increased at the expense of the black; (2) a male in which the opposite was very strongly marked, a black example of *A. trifolii*, the only one obtained this year, and one with extreme red suffusion.—Mr. Rayward, ova of

Plebeius argus (*ægon*) laid naturally on *Erica cinerea*.—Dr. Chapman, Lepidoptera obtained by him in Sicily, *Oreopsyche kahri*, *Depressaria thapsiella*, *D. ferula*, &c.—Mr. Kaye, a box of Brazilian butterflies taken by him in the early part of the year, including *Morpho anaxibia*, *M. menelaus*, *M. hercules*, *M. lertes*, *M. æga* and the rare *M. cytheris*, the beautiful *Papilio ascanius*, five species of *Heliconius*, species of *Catagramma* and *Callicore*, numerous very beautiful Erycinidæ, the Ithomiine *Mechomitis lysimnia* with its Pierine mimic *Dismorphia astyoche*, caught on the same flower-heads at Castro.—Mr. Sich, specimens of *Monopis weaverella*, a rare species only recently fully differentiated from *M. spilotella*. He also showed the hybernaculum of *Yponomeuta cognatellus* on *Euonymus* twigs.—Mr. Platt Barrett, a large collection of butterflies taken in Sicily during the last two years, and read a paper on the exhibit and the localities he visited, illustrating his remarks by a large number of lantern slides, including a series of views of Messina before and after the terrible earthquake of which he and his son were among the survivors.

October 27th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Ashdown exhibited examples of the various species of Lepidoptera met with by him during a few weeks spent in Switzerland in July last, including *Apatura iris*, *Issoria lathonia*, *Melitæa phæbe*, *Limenitis camilla*, *Erebia lappona*, *Colias phicomone*, *Cupido osiris* (*sebrus*), and Mr. Newman, a living larva of *Polygonia c-album*, and a long series of females of *Agriades thetis* (*bellargus*), from Folkestone.—Messrs. H. Moore, Sich, R. Adkin, and L. Edwards exhibited numerous teratological specimens of Lepidoptera to illustrate the remarks of Dr. Chapman in his paper.—Mr. South, series of (1) *Coremia unidentaria*, bred from ova deposited by a reddish-banded female; the reddish and the black-banded forms were about equal in number; (2) *Acidalia aversata*, bred from ova deposited by a typical female, and gave an analysis of the banded and plain forms produced; (3) *Boarmia gemmaria*, bred from ova of var. *perfumaria*, the resultant imagines being almost all of the varietal form; (4) *B. abietaria*, specimens bred from New Forest larvæ; (5) *Pionea* (*Scopula*) *lutealis*, a series from Durham, whiter, more strongly marked, and larger than southern examples; and (6) greyish forms of *Larentia didymata*, from Weardale, Durham.—Mr. Schooling, a var. of *Arctia cæja*, in which the fore wing markings were so aberrantly grouped and enlarged as to give no indication of what the normal marking was.—Dr. Chapman, a large number of teratological specimens lent him by Mr. Tutt, Mr. Pickett, Dr. Hodgson and others, to illustrate the paper he subsequently read, entitled "Notes on Teratological Specimens."

November 10th, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. W. G. Sheldon, F.E.S., of Croydon: Lieut. H. F. Stoneham, of Streatham; Mr. A. J. Lawrence, of New Oxford Street; and Mr. B. S. Curwen, of Richmond, were elected members.—Dr. Hodgson exhibited selected examples of *Agriades coridon*, mainly females, to show the prevalent slightly blue scaled form from Dover and Clandon in 1904 and 1906 respectively, and from Sussex, Surrey, and Herts, in 1910.—Mr. Platt Barrett, bred specimens of *Vanessa io* of a curious greasy-looking appearance, from mal-development of the scales.—Mr. R. Adkin, a bred series of *Lithosia caniola* from Devon-

shire, and read notes on the larval habits. They fed mainly on lichen and lettuce.—Mr. Newman, a curious specimen of “blue,” which it was suggested might be a natural hybrid between *A. coridon* and *P. icarus* or *A. thetis* and *P. icarus*, and also a male *Polygonia e-album* with yellow ground, of which ten others had been reared.—Mr. Sich, *Limenitis populi*, taken by Mr. E. Sich in Austria.—Mr. Moore, *Perrhybis pyrrha* from Callao, Peru.—Mr. Turner, a teratological specimen of *Danaüs limniace* with a long indentation in the dwarfed left fore wing.—Mr. Buxton, a box of teratological specimens, including a number of species with the left hind wing dwarfed or missing.—Mr. Barnett, a series of *Acidalia rusticata* from Erith.—Mr. R. Adkin read the Report of the Conference of Delegates of the Corresponding Societies of the British Association. The remainder of the evening was devoted to the exhibition of lantern slides by Messrs. Lucas, Dennis, West, Tonge, and Main.

November 24th, 1910.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Annual Exhibition of Varieties.—Mr. Platt Barrett exhibited a very long series of *Melanargia pherusa* from Sicily to illustrate the variation of the species, and also of *M. galathea* to show various Sicilian local forms.—Mr. Sich, some of the more local species of the genus *Tinea*, including *T. fulvimitrella*, *T. picarella*, *T. confusella*, &c.—Mr. R. Adkin, a series of Eastbourne *Polyommatus icarus*, contrasting the spring and autumn females, showing strong development of the red markings, and including a fine under side aberration. He also showed a short series of hybrid *Nyssia zonaria* and *Biston hirtaria*, males and females.—Mr. Tonge, some extremely dark smoky *Cosmotriche potatoria* bred from Deal larvæ, a *Brenthis euphrosyne* with pale chocolate brown ground, from Polegate, several *Agrotis exclamationis* in which a large black blotch replaced the usual discal markings, and some excellent enlarged photographs of eggs of lepidoptera.—Dr. T. A. Chapman, a long series of *Pararge egeria* to show the great range of variation in Western and South Western Europe.—Messrs. A. Harrison and H. Main, several series of mainly bred *Boarmia repandata* to show the local variation in the North, South, and West of England and the West of Ireland.—Mr. Main, on behalf of Mr. Göttmann, various forms of *Vanessa io*, *Euranessa antiopa*, and *Aglaüs urticæ* in the province of Yenesei, Siberia, extremely like the forms so frequently produced of late in temperature experiments, and of which Mr. W. Schmasmann exhibited a considerable number for comparison.—Mr. W. J. Lucas, the English trap-door spider, *Atypus affinis*, and several of its silken tubes, with a *Pterostychus madidus* discovered in one of them, and a small collection of butterflies taken by Patrol-leader S. F. Irwin, on his visit to Canada with Sir F. Baden Powell, including *E. antiopa*, *Anosia plexippus*, &c.—Mr. H. M. Edelsten, a fine bred series of *Dianthecia luteago* var. *barrettii* from Devon, *Tapinostola extrema* bred from Northampton, and a specimen of *Leucania l-album*.—Dr. Hodgson, groups of varieties of British Rhopalocera and Anthrocerids to show somewhat extreme divergence of variation in each of several species, and also to show convergence of species in their variation.—Mr. A. E. Gibbs, the various Palæartic forms of *Papilio machaon*, including a fine large *britannicus*, an *aurantiaca*, and spring and

summer forms of the Japanese *hippocrates*.—Mrs. Hemming, Argynids bred and captured in 1909-10, including melanic *Dryas paphia* and several under sides of the same species varying from brown to green.—Captain Cardew, an extremely dark specimen of the ab. *fusca* of *Canobia rufa* from Norfolk, *Anthrocera vicie* ab. *confusa*, extremely light and dark forms of *Eidonia carbonaria* from Rannoch, a unicolorous male of *Epione advenaria*, and a light straw *Ematurga atomaria*.—Mr. Scorer, a *Euchelia jacobææ* with the costal streak and apical spot united, and a pale salmon coloured example, specimens of *Euchloë cardamines* with very large discal spots, and a *Grammesia trilinea* with a strongly elbowed outer discal line.—Mr. Percy Bright, a large number of the finest aberrations of numerous species of British Lepidoptera, including forty-one very striking examples of *Abraxas grossulariata*, from almost unicolorous white to nearly entirely yellow, and a bred small specimen without scales; a *Triphena fimbria* with white replacing the yellow; an extreme melanic *Eubolia bipunctaria*; a gynandromorph of *Eidonia atomaria*; an *adonis*-like *Polyommatus icarus*; several *Polygonia c-album* with straw yellow ground; a *Pieris napi* with blackish outer margins; an extremely blue female of *Agriades thetis* with unusually large orange spots; a *Pseudoterpna pruinata* with black bands across the wings, &c.—Mr. R. South, on behalf of Mr. Yates, of St. Anne's-on-Sea, a series of *Luperina guenéei* taken this year, and a series of very varied forms of *L. testacea* with which he compared and contrasted them in detail; a short series of bred *Phibalapteryx lapidata* from Glasgow ova; and three specimens of *Oria (Synia) musculosa* taken by Mr. H. Haynes, near Salisbury, in 1909.—The Rev. F. D. Morice, a collection of about three hundred of the most conspicuous and handsome European and Mediterranean species among the sawflies, chrysid, ants, fossorial wasps, and true wasps, and gave a very interesting short account of the habits in the various groups.—Mr. H. W. Andrews, a unicolorous grey form lacking the yellow markings of the dipteran *Prosenia sybarita*, from N. Kent.—Mr. Edwards, numerous W. African species, chiefly the genus *Cymothoë*, which show very strongly marked sexual dimorphism.—Mr. West (Greenwich), his collection of British Homoptera.—Mr. Masters, a *Vanessa atalanta* taken in Jersey, with blotched and confused markings comparable only to those produced in recent temperature experiments with the species.—Mr. Blenkarn exhibited a specimen of the genus *Ephyra*, with marking suggestive of both *E. porata* and *E. punctaria*.—Rev. J. E. Tarbat, specimens of a very light form of *Nemeophila plantaginis* from S. Hants, and a very dark form from Witherslack.—Mr. W. G. Sheldon, a fine series of all the European species of *Neptis*, *Apatura*, and *Limenitis* taken by him in Hungary, Switzerland and France.—Mr. H. Page sent two beautiful series of *Polyommatus escheri* and *Cænonympha dorus*, from Abries and Digne respectively, in July, 1910.—Mr. L. W. Newman, long and varied series of closely inbred *Ennomos alniaria*, showing the washed-out appearance produced; a fine set of the melanic form of the species; hybrid *Smerinthus ocellatus*, male \times *Amorpha populi*, female; both males and a female; a long series of hand-painted figures of the finest aberrations bred by him: on behalf of Mr. Marshall, *Lycena*

orion with only the orbicular spots present, *Noctua subrosea* from the Bond collection, *Melitæa artemis* with heavily marked white wedges on all the wings, &c.—Mr. W. B. Pratt, ab. *coracina* of *Melitæa athalia* from W. Sussex; and *Melitæa aurina* with under side of hind wings having a black base and an extremely wide white central band.—Mr. W. J. Kaye, a complete transitional series between *Heliconius phyllis* form *anacreon*, and *H. phyllis* form *renusata* from the same locality in E. Bolivia.—Mr. T. L. Barnett, a large number of species taken by him this August in Wicken Fen, including *Tapinostola hellmanni*, *Leucania straminea*, *Nudaria senex*, *Herminia cribralis*, *Bankia argentula*, *Cænobia rufa*, &c.; a bred specimen of *Ægeria andreniformis* and its pupa case; and specimens of *Æ. culiciformis*, which had been somewhat common at Darent Wood.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, October 17th, 1910. Mr. F. N. Pierce, F.E.S., in the chair.—This was the opening meeting of the session, and was devoted to exhibits of the season's work.—Mr. T. Baxter, of St. Anne's, sent for exhibition a fine series of *Luperina guenéei* and its variety *baxteri*; he also contributed a note in which he pointed out that both forms were represented in a perfectly fresh condition, and that the view that the var. *baxteri* would become the typical *guenéei* with age must be abandoned. Mr. Baxter also sent an extraordinary aberration of *Abraxas grossulariata* which had the costal area of the left fore wing typical, the remainder, about three-fourths of the wing, being black; the right fore wing and the hind wings were typical. This fine asymmetrical specimen was captured in his garden at St. Anne's.—Mr. H. R. Sweeting exhibited a long series of *Hydræcia crinanensis*, captured this year near Londonderry; the variation appeared to be on exactly parallel lines with *nictitans*. The identity of the species was established by Mr. Pierce, who had an opportunity to examine the genitalia while the insects were still fresh. The same member further showed the following insects from Mold, North Wales, viz.: *Teniocampa gothica*, including an asymmetrical example in which the U mark on the left fore wing was only partly developed; *T. incerta*, *T. stabilis*, *Pachnobia rubricosa*, *Noctua festiva*, *N. brunnea*, *Aplecta prasina*, and *Boarmia repandata*, including an example of var. *nigra*.—Mr. F. N. Pierce showed *Abraxas grossulariata*, a short series from Wallasey, in which the variation was less striking than usual.—Mr. Wm. Mansbridge brought a series of the very black Knowsley race of *B. repandata* var. *nigra*, in which the submarginal pale line was almost absent; also short series of the same insect from Bude and Delamere Forest; *Boarmia gemmaria*, black form from North Kent; pale forms from North Devon, and var. *perfumaria* from the Cotswolds; a long series of *Aplecta nebulosa*, var. *robsoni*, var. *thompsoni*, and grey forms from Delamere.—Mr. Prince showed a fine series of *Cidaria reticulata* from Windermere, and a box of *Oporabia filigrammaria*, varying from nearly white to very dark fuscous, from Derbyshire.—Mr. R. Tait, Jun., exhibited the following, mostly in long series, viz.: *Agrotis agathina*, rosy form from North Wales; *Lithosia complana*, *Agrotis ripeæ*, *Epione apici-*

aria, *Leucania putrescens*, *Boarmia abietaria*, *Ellopiia prosapiaria*, from Pendine, South Wales; *Arctia villica* and *Numeria pulveraria*, from Abbotswood; *Teniocampa munda* and *Pachnobia leucographa*, from Lakeside, Windermere; *Tephrosia luridata* and *Cymatophora fluctuosa*, from Wyre Forest; *Apatura iris*, bred from Hunts larvæ, and *Phigalia pedaria*, varying from pale to black, from Mansfield, Notts.—Mr. B. H. Crabtree brought *Teniocampa munda* and *T. gothica*, a series of each (bred), from Windermere; a series of *Chorax graminis*, taken at light at Seascale; *Oporabia filigrammaria*, a varied series from Kinderscout, Derbyshire; *Biston hirtaria*, from Aviemore larvæ which had been in pupa for two years; vars. of *Abraxas grossulariata* from Huddersfield larvæ.—Mr. C. F. Johnson exhibited the following:—*Asteroscopus nubeculosa* and *Nyssia lapponaria*, from two-year-old pupæ from Rannoch; *Pachnobia leucographa*, *P. rubricosa*, and *Teniocampa munda* (bred), from Windermere; a long and varied series of *Oporabia filigrammaria*, from North Derbyshire; *Boarmia repandata*, from North Wales, North Staffordshire, and Knowsley, Lancashire, showing very varied forms; a specimen of *Abraxas grossulariata* var. *nigrosarsata* (bred), from Huddersfield.—The Rev. A. Miles Moss read a paper on the "Sphingidæ of Peru," and exhibited a magnificent collection of this group which he had made during the course of a three years' residence in Lima. The paper was further illustrated by a large number of beautiful water-colour drawings of the larvæ and food-plants of most of the species exhibited.—H. R. SWEETING & WM. MANSBRIDGE, *Hon. Secs.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY. — November 21st, 1910.—The first meeting of the 1910-11 session was held in the Manchester Museum, Owens College, on October 5th, Mr. C. F. Johnson, the President, in the chair.—The following exhibits were made of insects taken and bred in 1910:—Mr. R. Tait, Jun., F.E.S.: Series of the following insects:—Bred *Arctia villica* from Sussex ova, including one blotched variety; bred *Teniocampa leucographa* and *munda* from Lakeside; *Phigalia pedaria* from pale forms to var. *monacharia*, taken at Mansfield, Notts; *Tephrosia luridata*, taken in May in Wyre Forest. Long bred series of *Coremia ferrugata* and *C. unidentaria* from Witherslack; *Lithosia complana*, *Agrotis ripæ*, *Leucania littoralis*, bred *Epione apiciaria*, *Boarmia abietaria*, *Ellopiia prosapiaria*, and *Leucania putrescens*, all from South Wales. Bred *Numeria pulveraria* from Sussex; two specimens of *Palimpsestis fluctuosa* from Wyre Forest; four bred *Apatura iris* (female) from Hunts; bred *Melitæa aurinia* from Berkshire larvæ.—Mr. W. P. Stocks, F.R.C.S.: Short series of *Dianthæcia capsicola*, *D. cucubali*, and *Eupithecia venosata*, bred from campion flowers from Llanrwst; four *Tephrosia biundularia* from Bideford, belonging to the March-April brood, three of these being small and ochreous, the fourth being larger and paler and much more like the May-June brood; *Amphidasyus strataria* and *Cossus ligniperda* from Bideford. Series of *Lycæna astrarche* with var. *allous* from Silverdale; of *L. minima* and *Cænonympha typhon* from Witherslack. An example of *Nemoria viridata*, of a bright fulvous yellow colour, taken at Withers-

slack; melanic *Thera variata* from Witherslack. Series of *Melanthia albicillata*, *Abraxas sylvata*, *Nola confusalis*, *Ino geryon*, *Mamestra dissimilis*, *Lygris testata*, *Mamestra thalassina* (one dark form), *Numeria pulveraria*, *Malenydris salicata* (examples of both broods), *Cidaria truncata*, and an example of *Epione apiciaria*—all from Silverdale.—Mr. B. H. Crabtree, F.E.S.: Series of *Charceas graminis* and an example of *Agrotis præcor* from Seascale. Bred series of *Teniocampa munda* and *gothica* from Lakeside, of *Lycia hirtaria* from Aviemore (two years in pupa), of *Aplecta nebulosa* var. *robsoni* from Delamere, of *Boarmia repandata*, types from Delamere, and ab. *nigra* from Delamere and Knowsley. Bred vars. of *Abraxas grossulariata*.—Mr. A. E. Wright: Bred series of *Oporabia filigrammaria* from Burnley; series of *Hydriomena impluviata*, types and var. *infusata*, from Burnley; series of *Ematurga atomaria* from Witherslack, Burnley (including two fine dark unicolorous specimens), and Delamere; series of *Thera variata*, and *Cidaria corylata* from Delamere.—Mr. L. Nathan: *Phalera bucephala*, *Amphidasys betularia* var. *doubledayaria*, *Tephrosia biundularia*, *Cabera pusaria*, *Notodonta dromedarius*, and *Lophopteryx camelina*, bred from Delamere larvæ; *Satyrus semele*, *Epinephele ianira*, *Lycæna icarus*, *Agrotis vestigialis*, and *Lygris testata* from Lytham; *Lymantria monacha*, bred from Kent ova.—Mr. G. Storey: From Wicken: *Papilio machaon*, *Smerinthus ocellatus*, *Earias chlorana*, *Phragmatobia fuliginosa*, *Phragmatæcia castaneæ* (*arundinis*), *Gastropacha quercifolia*, *Pterostoma palpina*, *Arsilonche albovenosa*, *Leucania obsoleta*, *Meliana flammea*, *Grammesia trigrammica*, *Mamestra dissimilis* (*suasa*), *Bankia argentula*, *Hydrelia uncula*, *Lomaspilis marginata*, and *Collix sparsata*. From Cambridge: *Metopsilus porcellus*, *Periclocampa populi*, *Pheosia tremula* (*dictæa*), *Mamestra genistæ*, *Asteroscopus sphinx*, *Plusia moneta*, *Himera pennaria*, and *Eupithecia consignata*. From Tuddenham: *Arctia villica*, *Emmelia trabealis* (*sulphuralis*), *Acidalia rubiginata* (*rubricata*), *Eupithecia lariciata*, *Lithostege griseata*. From Brooklands, Cheshire: *Xylophasia rurea* var. *combusta*, *Agrotis saucia*, *Mamestra contigua*, *Perizoma alchemillata*, *Eupithecia sobri-nata*.—Mr. W. B. Lees: *Cænonympha pamphilus*, *Parasemia plantaginis*, *Venilia maculata*, *Plusia pulchra*, *Calymnia trapezina* (bred), from Dovedale. *Hepialus humuli*, *Phalera bucephala* (bred), *Acronycta megacephala* (bred), *Orgyia antiqua* (bred), *Xylophasia lith-orylea*, *Gonodontis bidentata* ab. *nigra*, and *Hybernia marginaria* var. *fuscata*, from South Manchester. *Acronycta alni* (bred) from Northwich, *Hepialus sylvina* from Styal, and *Ematurga atomaria* from Delamere.—Mr. W. Buckley: Series of the following:—*Teniocampa opima* from Wallasey ova, *Mamestra pisi* from Penmaenmawr ova, *Agrotis ashworthii*, *Dianthæcia conspersa* from champions in Anglesea, *Plusia moneta* from Woking larvæ, *Phalera bucephala* from Urmston larvæ, *Ino geryon* from Dovedale, *Amphidasys betularia* and intermediates between the type and var. *doubledayaria*, bred from Urmston larvæ.—Mr. A. W. Boyd, F.E.S.: Series of the following:—*Phigalia pedaria* types and var. *monacharia* from Dunham Park; *Ematurga atomaria* (varied forms) from Delamere and Rudheath; *Aplecta nebulosa*, vars. *thompsoni* and *robsoni*, bred from Delamere larvæ; *Ino geryon*, *Asthena blomeri*, and *Eustroma silaccata* from Dovedale;

Eucosmia undulata, *Asthena testaceata*, *Venusia cambrica*, and *Bomolocha fontis* from South Cheshire. An example of *Cabera cranthemata* ab. *approximata* bred from a Delamere larva; a series of *Bryophila glandifera* from North Devon, ranging from pale yellow to dark green.—Mr. A. E. Salmon: Living larvæ and cocoons of *Philosamia ricini* and *cynthia*; larvæ of *Cricula andrei* (just hatched); ova of the hybrid between *Caligula japonica* male and *simla* female, laid on September 1st, and the two parents.—Mr. J. H. Watson: Living ova of the leaf-insect, *Pulchryphyllum crurifolium*, from the Seychelles Islands, showing that even these imitate the seeds of a plant. A living example of the silk-moth, *Argema mimosæ*, from South Africa, and the cocoon it had just emerged from; two live *Philosamia ricini* and larvæ in various stages, from Bengal; also a new moth belonging to an aberrant group of the Saturniidae (*Hemileuca* sp.), allied to *H. newmargeni* (H. Edwards)—the specimens bred from pupæ collected in the neighbourhood of the Truckee Pass, on the Californian-Nevada divide of the Rocky Mountains; other species of the *Hemileucinae*, including *H. maia* var. *nevadensis*, *electra*, and *Pseudohazis marcata*, &c.—Mr. J. E. Cope: The following Coleoptera:—*Cicindela campestris* from Delamere; *Carabus nemoralis*, *catenulatus*, *granulatus*, *violaceus* (July), *Pterostichus vulgaris* (April), and *Dytiscus marginalis* (August), from Ashton Moss; *Byrrhus pilula*, *Corymbites ceneus*, and *Elater balteatus*, with larvæ and wood-borings, from Delamere; *Cetonia aurata* from Bournemouth; dissected mouth-parts of *C. nemoralis* and *catenulatus*, and of *P. vulgaris*.

November 2nd, 1910.—Mr. R. Tait, Jun., F.E.S., opened a discussion on the Lithosiinae or "Footman" moths, illustrating his remarks with series of insects from his collection. The following exhibits were made:—Mr. J. H. Watson, living cocoons of the Saturniidae: *S.* var. *meridionalis* from Syria, *S. spini* from Lower Austria, *S. cephalariæ* var. *haversoni* from Armenia, *S. pyretorum* from China, *S. paronia* from Yorkshire.—Mr. Wm. Mansbridge, F.E.S., series of *Dianthæcia carpophaga*, light forms from Eastbourne; *Boarmia repandata* from North Cornwall and Delamere, *B. gemmaria* from North Kent (black) and North Devon (light), *Mesoleuca albicillata* from Silverdale ova, *Aplecta nebulosa* with vars. *thompsoni* and *robsoni*.—Mr. H. Garnett exhibited under the microscope two species of Hymenoptera from Withington, Manchester, taken on October 2nd, 1910, one being *Anagrus incarnatus* female, "the Golden Fairy-Fly," and the other a species of *Cosmocoma*.—Mr. A. E. Wright showed a living *Dasypolia templi* female from Burnley.—Mr. A. W. Boyd, F.E.S., a box of Micro-Lepidoptera mainly from Cheshire localities.—Mr. C. F. Johnson, F.E.S., exhibited series of *Tephrosia punctularia* and *Thecla rubi* from Cannock Chase, *Nola confusalis* and *Chloroclystis debiliata* from Burnt Wood, *Drymonia chaonia* and *Cerura furcula* bred from larvæ from the Lake District; a long and varied series of *Oporabia filigrammaria* from North Derbyshire, *Asteroscopus nubeculosa* and *Nyssia lapponaria* from two-year-old pupæ, *Tenioctampa leucographa* and *munda* bred from the Lake District, *Eucosmia certata* from Market Drayton, and an example of *Abraxas grossulariata* var. *nigrocærulea* from Huddersfield.—A. W. BOYD, Hon. Sec.

RECENT LITERATURE.

1. *The Annals of Scottish Natural History*. Edinburgh, 1910.

Perhaps a somewhat greater amount of entomological matter appears in this volume than in the last. The papers and notes are:—Scottish Phoridae [Diptera], with Tables of all the British Species, and Notes on Localities (J. R. Malloch); *Ornithobius cygni* [Mallophaga], a Swan Parasite at Port-Allen-on-Tay (J. Waterston, B.Sc.); *Ornithobius goniopleurus* on Barnacle Goose (W. Evans); Aquatic Coleoptera of the Mid-Ebudes (F. B. Browne, M.A.); Further Notes on Nocturnal Hymenoptera (P. Cameron); On the Scottish Species of Oxyura (Proctotrypidæ), pts. iv. and v. (P. Cameron); Insect Fauna of Grouse Moors (P. H. Grimshaw); *Nyssia zonaria* in the Outer Hebrides (P. H. Grimshaw); Scottish Dragonfly Records (W. J. Lucas, B.A.); Notes on Siphonaptera (W. Evans); Some Terrestrial Invertebrates from Fair Isle (W. Evans); Insect Visitors of *Fumaria officinalis* (S. E. Brock).

2. *Monographia de los Nemoptéridos (Insectos neurópteros)*. [Memorias de la Real Academia de Ciencias y Artes de Barcelona.] By R. P. LONGINOS NAVAS, S.J. Barcelona, July, 1910.

Those who take an interest in the Neuroptera will welcome this monograph of one of the most peculiar divisions of the order—insects with hind wings narrowed into the form of tails, often with one or more dilatations in their length. The article of seventy pages on large paper has a coloured plate, and twenty-four illustrations in the text. It is perhaps a misfortune for British naturalists that it is written in Spanish. Most of the forty-four species belong to Africa; five only are European, none unfortunately being British.

Other recent papers by the same author are:—

(i.) *Mis excursiones entomológicas durante el verano de 1909*. (Bull. Ins. Catal. Hist. Nat.)

(ii.) *Hemeróbidos (Ins. Neur.) nuevos, 1910*. (Brotéria, Ser. de Vul. Scien.)

(iii.) *Osmylides exotiques nouveaux, 1910*. (Ann. Soc. Sci. Brux.)

(iv.) *Hémérobides nouveaux du Japon (Neuroptera)*. (Revue Russe d'Entom. 1909); written in Latin.

3. *Dermaptera of the Seychelles*. By M. BURR, D.Sc. Trans. Linn. Soc. Lond. vol. xiv. pt. 1. November, 1910. Illustrated.4. *Annals of Tropical Medicine and Parasitology*. Series T. M., vol. iv. No. 2. Liverpool, July, 1910.

The only contact with entomology is of course in connection with the cause of malarial diseases. Mosquitoes, therefore, figure largely in the part before us.

5. *Memorias do Instituto Oswaldo Cruz*. Ano 1910, Tomo ii. Fascículo 1. Rio de Janeiro, 1909.

A beautifully illustrated periodical; but this part deals with animals much lower than insects.

W. J. LUCAS.

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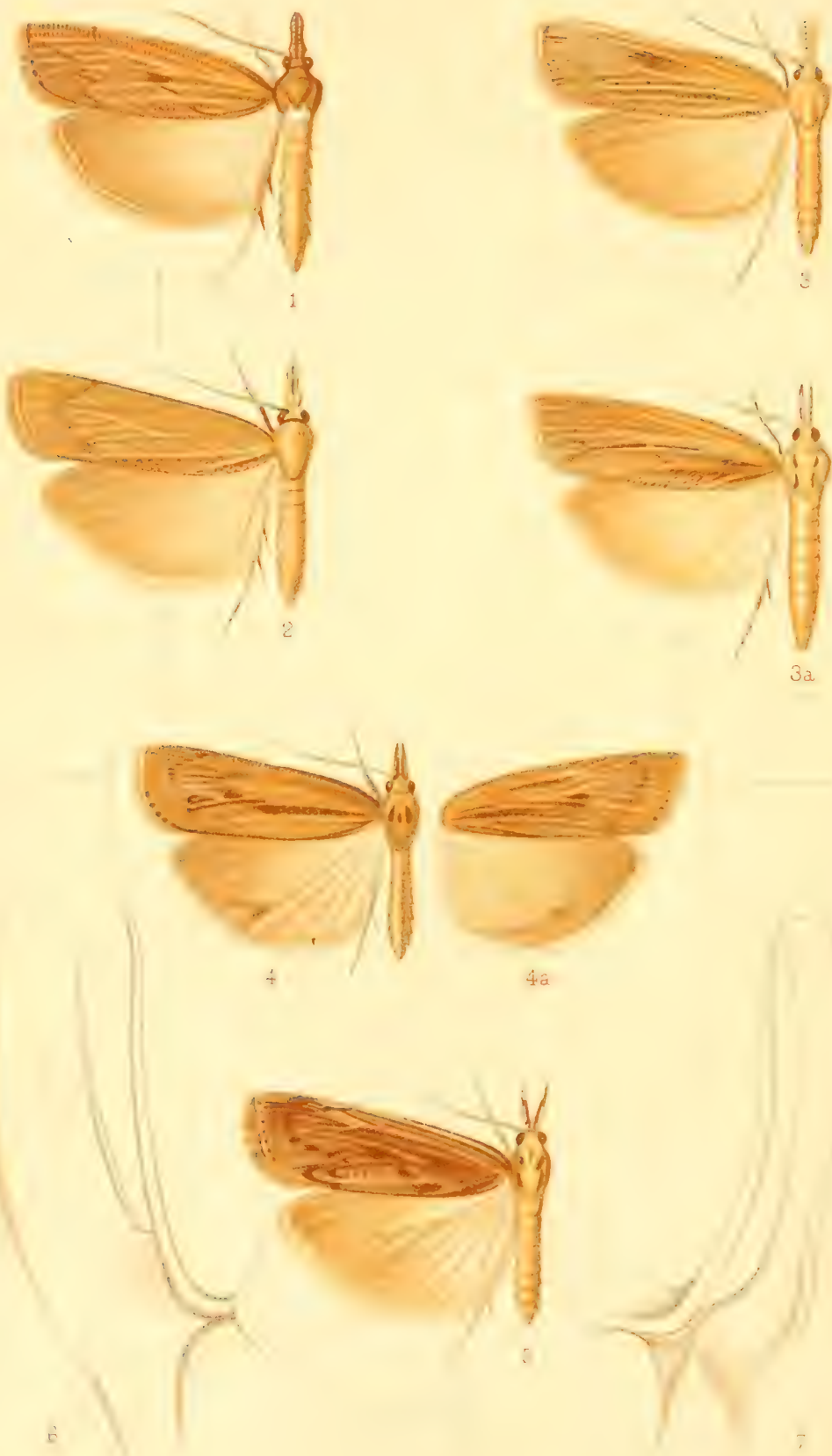
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SOME SPECIES OF CRAMBI.

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SOME SPECIES OF CRAMBI, WITH DESCRIPTIONS OF TWO NEW ONES.

BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

(PLATE I.)

MR. GEZA UHRYK collected in several localities for me in Hungary during the year 1909. In July, at Drava Sarvas, Szerem Co., he obtained a single male specimen of a *Crambus* which seemed to me quite different from any species which I knew. Dr. Rebel, to whom I submitted this Drava Sarvas example, pronounced it to be undoubtedly a new species, unless it were identical with the recently described *Crambus hungaricus* (Pl. I. fig. 5), which he had not seen, and with specimens of which he advised me to compare my example. Through the kindness and courtesy of the Director and the Lepidopterist of the Hungarian National Museum, I have been able to examine specimens of *C. hungaricus*, Schmidt (Arch. Zool. i. No. 9, pp. 31-32, 1909), and to submit the same to my friend Dr. Jordan, together with the single specimen of the new species referred to above, and a series of *C. contaminellus* (Pl. I. fig. 1). Dr. Jordan has kindly sent me numerous notes on these insects, upon which the remarks and descriptions of the present article are based.

Crambus hungaricus has a fully-developed retinaculum projecting from the costa of the fore wing, like *C. geniculeus*, *C. selasellus*, *C. culminellus*, and others; whereas the present new species has only a tuft of scales projecting forward from the median vein, as obtains in *C. contaminellus*, *C. inquinatellus*, *C. perllellus*, *C. tristellus*, and allies. The antennæ of *C. hungaricus* (male) are prominently serrated, as stated by the author. The clasper of that sex is broad and sole-shaped, and is devoid of the long rod found in *contaminellus* and the present new species. The scaling on the outer surface of the clasper, moreover, is similar to that of the abdomen, while in *contaminellus* and the present

new species the scales are long and narrow. I feel, therefore, justified in describing the specimen as representing a new species.

Crambus uhryki, sp. nov. (Pl. I. figs. 2 and 6.)

♂. Similar to *C. contaminellus*, Hübn. Fore wing shorter, the apex more rounded, the outer margin not being incurved or straight below the apex, as is the case in *C. contaminellus*; upper surface without white scales, the black dusting as in the species mentioned, but no black dots at margin; fringe darker, whereas in *C. contaminellus* the long as well as the short scales of the fringe have white tips; the long scales in the new species have a dark apex, median line not marked, discal line very indistinct, in the same position as in *C. contaminellus*, but not at all angulated. Hind wing broader, fuscous, lighter below the cell, apex more rounded than in *C. contaminellus*; the fringe more uniform in colour, not showing such a prominent dark line as in the allied species. Genitalia: Both the dorsal and ventral process of the anal segment a little broader than in *C. contaminellus*, the dorsal one nearly straight in a lateral view, only the extreme tip being curved downwards; the ventral process broader than the dorsal one in a view from above. Clasper composed, as in the allied species, of two pieces, both of about the same length, the ventral piece broad and but feebly chitinized, with the apex rounded. This piece is of practically the same width throughout, being about twice as broad as it is in *C. contaminellus*. Its inside is densely covered with erect narrow scales, recalling a cloth brush. The second piece of the clasper consists of a long rod-like, strongly chitinized process, which originates dorsally at the base of the first piece. This rod bears a dense fringe of hairs, which in *C. contaminellus* are less numerous. Moreover, the rod is less curved and less hollowed out along the inner surface than in that species.

One male; Drava Sarvas, Szerem Co., Hungary, July, 1909.
Coll. G. Uhryk. (Type in the Tring Museum.)

Crambus salinellus nepos, subsp. nov. (Pl. I. figs. 3, 3a, and 7.)

There are two closely allied species of *Crambus* known from England—*C. contaminellus*, Hb. (Pl. I. fig. 1), and *C. salinellus*, Tutt (Pl. I. figs. 4 and 4a). The former is reported to be widely distributed on the Continent, although some of the records may refer to some other closely related species. As far as I know, *C. salinellus* has hitherto only been recorded on the Continent from Germany, but I am now able to add a form of that species to the Hungarian fauna. The two species *contaminellus* and *salinellus* can be separated from one another by the following three chief distinguishing characters:—

In *salinellus* the line situated on the fore wing about half-way between the cell and the distal margin is evenly curved from the costal margin to the lower median vein, while this line is dentate in *contaminellus*. The patagia are conspicuously edged with black in *salinellus*, while there are no black scales on them in *contaminellus*.

The long rod-like process of the clasper is longer in *salinellus* than the elongate sole-shaped main portion of the clasper, and shorter than that flap in *contaminellus*. Moreover, the rod-like process is thicker in *contaminellus* than in *salinellus*.

A long series of specimens from Flamenda, Deliblat, Hungary, collected in June, 1909, by Mr. Geza Uhryk, and which did not appear to me to agree with what I knew as *contaminellus*, prove on closer examination to agree with *salinellus* from the east coast of England, except in some minor points. The specimens, taken all round, are larger than British *salinellus*, and are less marked with black on the fore wing. The black streak which is situated below the cell, and connects the two lines extending towards the base, is much fainter in the Hungarian specimens than in British ones, and the angle formed by the outer line below the lower vein is much less prominent in the former. Moreover, the patagia have fewer black scales on the whole; some females are altogether without black on the patagia, and have also no black marginal dots on the fore wing. The genitalia do not differ from those of British *salinellus*, except that the rod-like process of the clasper appears to be a little longer.

A large series of both sexes taken in June, 1909, at Flamenda, Deliblat, Hungary, by Mr. Geza Uhryk. (Type in the Tring Museum.)

EXPLANATION OF PLATE I. — 1. *Crambus contaminellus*, Hb. 2. *C. uhryki*, sp. nov. 3, 3a. *C. salinellus nepos*, subsp. nov. 4, 4a. *C. salinellus*, Tutt. 5. *C. hungaricus*, Schmidt. 6. *C. uhryki*, male clasper. 7. *C. salinellus nepos*, male clasper.

SURREY ORTHOPTERA.

(EARWIGS, COCKROACHES, CRICKETS, AND GRASSHOPPERS.)

BY W. J. LUCAS, B.A., F.E.S.

IN the Orthoptera we have a particularly interesting group of insects, since, with the exception of a few very primitive species, which themselves have sometimes been placed with the Orthoptera, this Natural Order probably contains the oldest insects which have come down to the present geologic age.

Those which breed in the British Isles are but thirty-nine, while of these eight are not indigenous and are therefore not usually to be met with under natural conditions. Casual visitors, especially from amongst the Cockroaches, often appear, but of course must not be looked upon as British insects. Out of the thirty-nine some twenty-seven are at present known to occur in Surrey.

As might be expected, there is much diversity to be found amongst the members of so ancient a group of insects. Consequently it is necessary to subdivide the Orthoptera into a number of Groups or Suborders. Those which contain British representatives are :—FORFICULODEA (Earwigs, &c.) ; BLATTODEA (Cockroaches) ; GRYLLODEA (Crickets) ; LOCUSTODEA (Long-horned Grasshoppers) ; ACRIDIODEA (Short-horned Grasshoppers). The MANTODEA (Praying Insects) and PHASMODEA (Leaf and Stick Insects) are not represented in these Islands.

Of the seven British FORFICULODEA (all Earwigs) Surrey is able to claim four, while two of the others—*Labia arachidis*, Yers. (indoors), and *Apterygida albipennis*, Meg.—are quite likely to occur.

Anisolabis annulipes, Lucas, is a dark wingless species which sometimes breeds in this country under artificial conditions. It has been accidentally imported with plants into Kew Gardens, but so far has not established itself there.

Labia minor, Linn., is often taken on the wing, flying round cucumber-beds, manure-heaps, &c., in the sunshine. Records are : Kew Gardens, April 14th, 1897 (W. J. L.) ; Kingston-on-Thames, April 27th, 1897 and June 2nd, 1899 (W. J. L.) ; Surbiton, July 14th, 1907 (W. J. L.) ; Wandsworth, August 15th, 1889 (Eland Shaw) ; Southwark Street, near Blackfriars Bridge, September 30th, 1908 (F. M. Dyke) ; Oxshott, October 3rd, 1908 (S. R. Ashby) ; Headley Lane, an example with large callipers (A. J. Chitty) ; Leatherhead (C. A. Briggs) ; Dormans (M. Burr) ; Reigate (E. Saunders) ; Dorking (H. L. F. Guermont).

Forficula auricularia, Linn., is one of our commonest insects, and is universally distributed. An interesting form—the variety named *forcipata*—has very highly developed callipers. A dark specimen of the typical form was taken, August 5th, 1900, by Mr. F. B. Jennings at Boxhill. While this earwig feeds normally on insects and animal food of a similar nature, it often does damage to dahlias, hops, and other cultivated plants. This insect and the next hibernate in the perfect form.

Forficula lesnei, Finot, is something like the common earwig, but is rather smaller, is brighter in colour, and has no wings. Its callipers, too, are of a different shape. It has been taken at Boxhill and Reigate (W. West) ; near Leatherhead (W. J. Ashdown) ; at Ranmore (W. J. L.) ; Merrow Downs, between Guildford and Newlands Corner (J. J. Walker).

All but one of the BLATTODEA known to breed in Britain have been found in Surrey, the one exception being the smallest indigenous species, *Ectobius panzeri*, Steph. If this occurs so far inland, it should be expected on heathy ground. The genus *Ectobius* alone is native.

Ectobius lapponicus, Linn.—Haslemere, June 22nd (Eland Shaw); near Boldermere, Wisley, July 5th, 1902 (W. J. L.); Devil's Punch Bowl, Hindhead, July 15th, 1909 (W. J. L.); Dorking (A. J. Chitty).

Ectobius perspicillaris (= *lividus*), Herbst.—Boxhill (C. A. Briggs); Mickleham (W. J. Ashdown).

Blattella germanica, Linn.—Aldershot (M. Burr), and no doubt in many London hotels and restaurants. This and the next four are seldom found out of doors.

Blatta orientalis, Linn., is universally distributed over the county.

Periplaneta americana, Linn.—Kew Gardens (W. J. L.).

Periplaneta australasica, Fabr.—Kew Gardens (W. J. L.).

Pycnoscelus surinamensis, Linn.—Kew Gardens (W. J. L.); the latest cockroach to establish itself in this county.

Of the GRYLLODEA there are but four British species, of which three have been found in Surrey. The fourth, *Nemobius sylvestris*, Fabr., occurs freely in the New Forest, and there seems to be no reason why it should not be found in Surrey, amongst dead leaves in old, dry, mixed woods.

Gryllus campestris, Linn.—I have but one record, Rotherhithe, 1904 (H. Moore).

Gryllus domesticus, Linn.—This is no doubt distributed throughout the county, though not out of doors, except sometimes in the summer; but I have records only for: Kingston-on-Thames (W. J. L.); Bisley (A. Ficklin, Junr.); Bayswater (F. P. Pascoe).

Gryllotalpa gryllotalpa, Linn.—Churt, 1901, and Milford, June 3rd, 1902 (G. Dalgliesh). The latter example was met with on the wing.

Nine insects belonging to the LOCUSTODEA are British. Out of these *Conocephalus dorsalis*, Latr., *Metrioptera albopunctata* (= *grisea*), *M. roeselii*, Hagen., and *Tettigonia verrucivora*, Linn., have not, I believe, been recorded for Surrey. *C. dorsalis* may be looked for on boggy ground, but *M. albopunctata* is a coast species, and the other two are very rare.

Leptophyes punctatissima, Bosc (July to September).—Marrow Downs (W. J. L.); Boxhill (C. A. Briggs); Bisley (A. Ficklin, Junr.); near Guildford (B. G. Cooper); Dorking (H. Guernonprez); Farnham (E. J. B. Sopp); Send (L. Rawes); near Ashted (W. J. L.); Walton-on-Thames (H. E. Annett); Oxshott (R. South); Surbiton (H. Goss); Wimbledon and Dormans (M. Burr).

Meconema thalassina De Geer (= *varium*) (July to October).—Leatherhead and Horsley (C. A. Briggs); near Ashted (W. J. L.); Kingston-on-Thames (W. J. L.); Surbiton (H. Goss); Richmond Park (W. J. L.); Coombe Wood and Ripley (Stephens);

Boxhill (R. McLachlan); Dormans (M. Burr); Bisley (A. Ficklin, Junr.); near Effingham Station (W. J. L.); Oxshott (W. J. L.); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis); Kew Gardens (W. J. L.).

Phasgonura viridissima, Linn. (August to October).—Strange to say I have no record for Surrey, since Stephens' record for Battersea Fields would no longer hold good.

Pholidoptera griseo-aptera, De Geer (August and September).—Near Bellagio, East Grinstead (M. Burr); Farnham, 1907, common (E. J. B. Sopp).

Metrioptera brachyptera, Linn. (August to October).—Wisley to Leith Hill (C. A. Briggs); near Ripley (Stephens); Coombe Wood (Stephens); Woking (W. J. L.); near Pyrford (W. J. L.); Oxshott Heath (W. J. L.); Black Pond (W. J. L.).

Of the eleven British representatives of the ACRIDIODEA nine have been recorded from the county. *Mecostethus grossus*, Linn., may occur in bogs, and *Chorthippus elegans*, Charp., should certainly occur in some damp grassy spots.

Gomphocerus rufus, Linn. (August and September).—Boxhill (R. McLachlan); Leatherhead (M. Burr); Redhill (G. E. Frisby); Reigate (T. R. Billups); Oxshott (M. Burr); Bookham Common (W. J. L.); Battersea Fields, early in the nineteenth century, by Samouelle (C. W. Dale).

Gomphocerus maculatus, Thunb. (June to September).—Redhill (G. E. Frisby); Farnham and Frensham (E. J. B. Sopp); Devil's Punch Bowl, Hindhead (W. J. L.); Merrow Downs (W. J. L.); Blindley Heath, near Godstone (M. Burr); Boxhill (R. McLachlan); Wimbledon (Eland Shaw); Oxshott (W. J. L.).

Stenobothrus lineatus, Panz. (July to September).—Boxhill (C. A. Briggs); Leatherhead (M. Burr); Redhill (G. E. Frisby); Merrow Downs (W. J. L.).

Omocestus viridulus, Linn. (June to September).—Leith Hill (C. A. Briggs); Esher Common, Oxshott, Horsley, Byfleet Canal, Bookham Common, and Wimbledon Common (W. J. L.).

Omocestus rufipes, Zett. (August and September).—Leith Hill (C. A. Briggs).

Stauroderus bicolor, Charp. (July to November); a very common species.—Esher Common, near Ranmore, near Oxshott, Bookham Common, and Newlands Corner (W. J. L.); Horsley, and a garden in Upper Tooting in 1901 (R. South); Send (L. Rawes); Redhill (G. E. Frisby); Frensham Heath (A. Thornley); Boxhill (R. McLachlan); Queen's Cottage Grounds, Kew Gardens (G. Nicholson); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis).

Chorthippus parallelus, Zett. (July to September); another very common species.—Oxshott Heath, canal near Byfleet, near Wisley, near Effingham Station, Bookham Common, Newlands Corner, and Ashted Woods (W. J. L.); Boxhill (C. A. Briggs);

Redhill (G. E. Frisby); Richmond Park and Wimbledon Common (Eland Shaw); Queen's Cottage Grounds, Kew Gardens (G. Nicholson).

Tetrix subulatus, Linn.—Dormans, East Grinstead (M. Burr).

Tetrix bipunctatus, Linn. (all the year round, as the species hibernates in the perfect form).—Bookham Common, Esher Common, Oxshott, Ockham Common, Horsley, and Boxhill (W. J. L.); Byfleet (G. T. Porritt); Dorking (H. Guernonprez); Royal Horticultural Society's Gardens, Wisley (R. J. Wallis).

[Additions to this list will be welcomed.—ED.]

ABERRATIONS OF THREE JAPANESE BUTTERFLIES.

BY A. E. WILEMAN, F.E.S.

Zephyrus attilia subgrisea, ab. n.

Blackish with a faint purplish tinge; a black mark at end of cell, and indications of the darker under side markings; traces of a bluish white marginal line on each side of the tail. Fringes white. Under side greyish white; fore wings have a brown elongate spot at end of the cell, edged with white and enclosing a faint white line; a brownish, slightly oblique, postmedial band, outwardly edged by a broad white band; the area beyond the band is suffused with brownish and traversed by a submarginal series of white-ringed blackish spots, those towards costa smaller than those towards inner margin, the latter outwardly edged with orange; marginal line blackish; on the hind wings the brown and the white bands are similar to those on the fore wings, but the submarginal spots are less clearly defined outwardly; the outer margin below vein three is orange enclosing two black spots, that between veins two and three round. Expanse, 32–36 millim.

Collection numbers, 2017 and 2018.

Two specimens from Yamato, July, 1894.

Zizera argia insolita, ab. n.

♀. On the under side the spots on the outer area unite and form longitudinal bars between the veins, six on fore wing and eight on hind wing.

Collection number, 2019.

One female specimen (the type) from Ushigome, Tokyo, May 7th, 1895.

Local distribution.—Hondo, Tokyo.

Habitat.—Japan.

Argynnis aglaia gutta, ab. n.

♂. On the under side there are no silvery spots on apical area of the fore wing, and the silvery basal spots of the hind wing run

together and form elongate blotches, a smaller silvery cloud at base of the costa. This aberration is very similar to that of *A. aglaia charlotta*, Haw.

Collection number, 2015.

One male specimen (the type) from Jozanke, Island of Yezo, August 13th, 1896. This is an aberration of the Japanese form of *aglaia* (*Argynnis fortuna*, Janson).

Local distribution.—Yezo, Jozanke.

Habitat.—Japan.

ON UNDESCRIBED EVANIIDÆ TAKEN AT KUCHING, BORNEO, BY MR. JOHN HEWITT, B.A.

By P. CAMERON.

Megischus claripennis, sp. n.

Black, the outer orbits, four anterior tarsi and the middle tibiæ testaceous, the basal joint of the hind tarsi white; the greater part of the head rufo-testaceous, the vertex blackish, the outer orbits broadly white, the basal four joints of the antennæ of a paler testaceous colour than the head; the basal part of the second abdominal segment rufous. Wings clear hyaline, the nervures black. ♀. Length, 8 mm.; terebra 13 mm.

Vertex smooth, bare and shining to the commencement of the eyes, the rest finely closely transversely rugose; the three spines are distinct, triangular, acutely pointed, the anterior longer than the others and separated from them by a greater distance than these are from each other. Palpi dark testaceous. Prothorax smooth, a little longer than it is wide at the apex, becoming gradually wider from the apex of the basal fourth. Mesonotum shagreened, a transverse furrow near the apex; in front of this is a wider, more irregular furrow; behind it a deeper, pyriform fovea. Scutellum smooth, longer than wide, narrowed gradually to a sharp point at the base, which is bordered by a crenulated furrow. Metanotum closely reticulated, more finely and closely at the base than elsewhere. Propleuræ smooth, mesopleuræ aciculated, the metapleuræ irregularly obliquely striated. Abdominal petiole fully one-half longer than the rest of the abdomen, finely closely striated, of equal width and almost bare; the rest of the abdomen becomes gradually widened towards the apex, the top roundly curved, the lower part straight. Middle femora roundly dilated at the base. ♀.

Hind femora with a short acute tooth near the apex of the basal third and a thinner one near the base of the apical third; between these, on the basal half, are three small bluntly rounded teeth, and, on the apex, are four small teeth, which become smaller successively towards the apex.

Megischus palliditarsis, sp. n.

Black, the head rufo-testaceous, the orbits broadly white, the propleuræ and prosternum rufous, the base of second abdominal

segment rufo-testaceous; legs rufo-testaceous, the posterior black, the base of middle tibiæ, their apex more narrowly, the middle tarsi, basal half of hinder (the basal joint to near the apex), and, to a less extent, the fore tarsi, white. Abdominal petiole about twice longer than the rest of the abdomen. Terebra almost as long as the body. Wings clear hyaline, the nervures and stigma almost white. Cephalic tubercles short, bluntly rounded. Pro- and mesothorax smooth and shining. Scutellum broadly triangular, the bordering furrows weakly crenulated. Metanotum strongly aciculated. Pleuræ smooth. ♀. Length, 7 mm.; terebra 6 mm.

Outer orbits lined with white. Mandibles pale, black at the apex. Basal joints of palpi black, the rest testaceous. Middle femora of uniform thickness. Pronotum about one-half longer than it is wide at the apex. There are only two teeth on the hind femora, a conical one behind the middle and a small conical one near the base of the apical fourth.

Megischus ruficollis, sp. n.

Black, the head and prothorax red, the face and oral region paler in tint, the outer orbits broadly and the basal half of the mandibles pale yellow; the basal four or five joints of the antennæ and the palpi pale testaceous. Four front legs pale testaceous, the femora darker coloured, the hinder black, the knees rufo-testaceous, the narrowed basal part of the tibiæ fuscous, the tarsi white; there are two large teeth on the femora, one near the apex of the basal third, the other near the base of the apical fourth; there are two short stumpy teeth at the base, four small, sharper ones between the large ones, the apical more widely separated from the others than these are from each other; there are three small ones beyond the apical large tooth, the basal longer and sharper than the others and touching the large one, the other two are stumpy, the basal larger than the apical. Wings hyaline, the stigma and nervures fuscous, the base of the stigma paler. ♂. Length, 7 mm.

Kuching, Borneo (John Hewitt, B.A.).

Face shagreened, closely transversely striated, more strongly on the sides; the vertex is more finely striated. The lower frontal spine is more sharply pointed than the others. Metanotum reticulated, sparsely so at the apex; the metapleuræ aciculated, the pro- and mesopleuræ smooth. Hind femora and abdominal petiole closely transversely striated. Scutellar fovea clearly defined, twice wider than long, of equal width, deep; the base bounded by a narrow smooth keel, the sides by a smooth wide one. Pronotum about one-fourth longer than it is wide at the apex. The cubitus is straight, extends to the apex of the transverse cubitus (which is straight) and forms a sharp angle with it.

Gasteruption erythrostomum, sp. n.

Black, the apex of clypeus, its sides more broadly than the centre, the apex of pronotum narrowly, the sides of the propleuræ more widely, the mark narrowed and rounded at the base, and a large triangular mark on the apex of the prosternum, rufous: the basal

half of the prothorax tinged with rufous; the sides of the second to fifth abdominal segments of a darker rufous colour. The anterior coxæ, apex of middle pair, the four anterior trochanters, and the four anterior femora rufous, the middle coxæ black, except at apex, the middle femora black below, the four anterior tibiæ and tarsi white, the anterior tibiæ broadly black behind, the black band farther from the base than it is from the apex, the middle have the basal fourth and the apex narrowly white, the rest being black; the apex of the first joint of the middle tarsi narrowly and the other joints entirely above, are black; the hind legs black, a broad irregular band near the base of the tibiæ, and the first and second joints of the hind tarsi except at the base white. Wings hyaline, the nervures and stigma black. ♀. Length, 15 mm.; terebra 17 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth and shining, the cheeks, lower part of front, face and clypeus densely covered with silvery pubescence. Ocelli placed in front of the hinder part of the eyes; they are in a curve; the hinder are separated from each other by a little greater distance than they are from the eyes; the latter distinctly converge below and are separated from the mandibles by less than the length of the antennal pedicle. Prothorax longer than the mesonotum with the scutellum, smooth. Base of mesonotum smooth, the rest stoutly transversely striated, the striæ more or less curved. Scutellum smooth, the apex with two or three striæ. Metanotum coarsely irregularly reticulated; the apex less strongly than the base. Pro- and mesopleuræ alutaceous, the depressed apex of the latter smooth and shining, the lower half of the depression striated. Metapleuræ reticulated, weakly at the base, more strongly at the apex. The first abdominal segment as long as the following three united. Antennal pedicle twice longer than wide; the third joint about one-quarter longer than the fourth.

***Evania trichiosoma*, sp. n.**

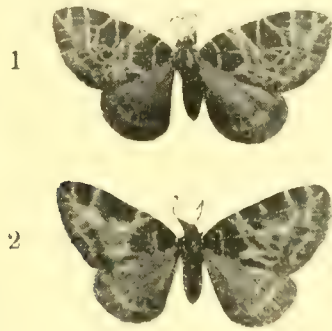
Black, the apical slope of the metanotum and sternum densely covered with white pubescence, the rest of the thorax, head and the petiole of abdomen more sparsely covered with long black hair; the apex of the fore coxæ, of the four anterior trochanters and the middle joints of the four anterior tarsi testaceous, the pubescence on the legs is longer and denser than usual; it is black, and on the under side of the coxæ is a dense covering of silvery pubescence. The long spur of the hind coxæ is about one-fourth of the length of the metatarsus, and is a little longer than the second joint; tibiæ and tarsi not spinose. Metasternal process strongly diverging. Face strongly striated, the striæ clearly separated; there are two striæ down the inner side of the outer orbits. Wings hyaline, very iridescent; basal abscissa of radius rounded, the apical is faint, oblique, rounded at the base. ♂. Length, 4 mm.

Ocelli in a slight curve, the hinder separated from each other by a slight but distinctly greater distance than they are from the eyes. Front stoutly striated, the striæ slightly oblique, distinctly separated. Malar space as long as the eyes. Puncturation on thorax strong, the punctures round and clearly separated; the upper part of propleuræ

to shortly below the middle smooth; the base of the propleuræ with a row of punctures running from top to bottom. Occiput and cheeks strongly keeled, furrowed on the inner side of the keel, the furrow bearing some striæ. Antennæ stout, the third joint about one-fourth shorter than the following two united. Basal half of mandibles rufo-testaceous; the palpi testaceous.

AN INTERESTING ABERRATION OF *EUSTROMA RETICULATA* (SCHIFF).

By LOUIS B. PROUT, F.E.S.



Eustroma reticulata. 1, normal; 2, aberration.

Eustroma reticulata is certainly one of the less variable of our "carpet moths," and the Rev. E. J. Nurse, Rector of Windermere, is to be congratulated on having bred, at the end of July last, the striking aberration of which the photograph is reproduced above. Knowing my interest in the Geometridæ, and especially in the variation of the Larentiinae, our Editor has asked me to comment upon it. Really aberrant forms of this species must be exceedingly few and far between, and I have only notes of two. One is the large, dark example with the white lines—or some of them—reduced to a minimum, rather vaguely described by Hodgkinson (Entom. xxiv. 266). The other is in Mr. Sydney Webb's collection (from that of S. Stevens), and is an asymmetrical example, in which the dark colouring of the median area in the right fore wing is concentrated into a large costal blotch, a triangular inner marginal mark, and a slight mark between but distally to these, the rest of the area remaining pale. As will be seen, Mr. Nurse's example belongs to the same "phase of variation," and it is interesting that it is similarly asymmetrical. Almost the only other direction of variation known to me in this species is in the degree of approximation of the two central white lines at the costa. Sometimes these remain widely apart, sometimes they approach or even touch, sometimes they meet *before* the costa, enclosing a more or less ovate dark blotch (ab. *ovulata*, Borgmann).

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Continued from p. 32.)

Dysethia variegata, sp. n.

Fore wings ochreous, irrorated with purplish brown, and clouded with this tint on the basal half and on the area beyond postmedial line; antemedial line chocolate-brown inwardly edged with ochreous, angled and thickened on the veins, but extended to the costa; three chocolate-brown spots on the costa, pale edged, the first triangular with a small spot (discoidal) below, the lower end of the second curved outwards, the third small; postmedial line ochreous, sinuous, preceded by brown dots on the veins, commencing at the truncate end of the second costal spot; fringes brown, tips paler. Hind wings fuscous with an indistinct postmedial line, which is angled below the middle.

Expanse, 29–31 millim.

Collection number, 877 a.

Two male specimens from Arizan (7300 ft.), September, 1906, and August, 1908.

Perhaps this may prove to be only a geographical form of *D. bicommatata*, Warren.

Dysethia taiwana, sp. n.

Fore wings dark purplish grey; three pale edged dark chocolate spots on the costa, the first small and triangular, the second large and curved, the third smaller than the first and somewhat quadrate; antemedial line dark chocolate, sinuous, not in evidence much above median nervure, slightly expanded on the inner margin; postmedial line sinuous, dark chocolate towards the inner margin, above which it is angled, indicated by chocolate dots from above vein two to the lower end of second costal spot; a diffuse, ochreous, transverse shade before the postmedial line. Hind wing fuscous with a faintly darker postmedial line, obtusely angled below the middle.

Expanse, 34 millim.

Collection number, 877 b.

A male specimen from Arizan (7300 ft.), August 18th, 1908.

Closely allied to *D. ocyptaria*, Swinhoe.

Lygranoa violescens, sp. n.

♂. Fore wings brown, suffused with violet-grey; costa ochreous brown; antemedial line brown, sinuous, evanescent towards costa; two brown spots on the costa, darker edged, a brown dot below the first, the second somewhat lunular; postmedial line brown, sinuous, outwardly edged with violet-grey; submarginal line ochreous, wavy, only distinct towards the inner margin. Hind wings dark fuscous brown. Under side of fore wings fuscous, ochreous on costal area, discoidal mark blackish; postmedial line dusky, pale edged; hind wings ochreous brown, powdered with darker, discoidal mark and wavy postmedial line blackish.

♀. Rather browner; the costal spots on fore wings darker; a diffuse, dusky, postmedial line on hind wings.

Expanse, ♂ 27 millim., ♀ 32 millim.

Collection number, 877.

One specimen of each sex from Kanshirei (1000 ft.), June 17th, 1906.

Allied to *L. fusca*, Butler.

Lobogonia bilineata, sp. n.

♂. Fore wings yellow ochreous, irrorated with black; ante- and postmedial line reddish, slightly expanded and rather darker on the costa, the former bent below costa, both inclined outwards on the inner margin; a black dot in the cell, an elongate one just beyond second line, and two dots before the outer margin; fringes ochreous, black below vein four and above vein six. Hind wings whitish ochreous, a dusky dot at end of the cell, and a dusky postmedial line; fringes marked with black at costa and anal angle. Under side ochreous irrorated with blackish; basal area of fore wings suffused with blackish; postmedial line blackish, diffuse towards the costa.

Expanse, 30 millim.

Collection number, 871.

A male specimen from Arizan (7300 ft.), September 13th, 1906.

Allied to *L. ambusta*, Warren. The outer margin of hind wings not angled at vein four.

Lobogonia aculeata, sp. n.

♂. Fore wings whitish ochreous with a few black scales chiefly on the outer half of the wings; two black triangular marks, the apex of the second extended to a longitudinal black mark just beyond lower angle of the cell; a faint brown line from lower end of each costal mark to the inner margin; an almost straight submarginal band composed of scattered black scales; a black dot at end of the cell, one on costa before apex, and one on the outer margin between veins five and six; fringes black, except at apex, vein four, and just above the tornus. Hind wings rather paler, freckled, especially on outer area, with fuscous brown; medial band black-brown, straight from inner margin to the cell; fringes marked with black; outer margin strongly angled at vein four.

Expanse, 22 millim.

Collection number, 872.

A male specimen from Kanshirei (1000 ft.), April 22nd, 1906.

Near *L. conspicuata*, Leech.

Cidaria arizana, sp. n.

Fore wings velvety black; subbasal line whitish, almost straight; nervures marked with whitish; antemedial and medial lines whitish, wavy, approaching each other below the middle, enclosed space partly filled in with whitish, flecked with ochreous on the veins; postmedial whitish, projected inwards along vein two almost to the

medial line, and bilobed about middle; the space between post-medial and whitish wavy submarginal line is, except towards costa, whitish dusted with blackish, and flecked with ochreous on the veins; marginal line whitish, fringes whitish inclining to ochreous at base, traversed by a blackish line, and chequered with blackish at the tips. Hind wings fuscous; postmedial line darker, outwardly edged with whitish; submarginal line whitish, macular.

Expanse, 50 millim.

Collection number, 835.

A female specimen from Arizan, September 14th, 1906.

Closely allied to *C. mactata*, Felder; perhaps may be a local form of that species.

Cidaria interrupta, sp. n.

Fore wings ochreous brown, speckled with darker brown; basal patch blackish, limited outwardly by an angled white line; medial band blackish, edged with white, interrupted by veins two, three, and four, the portion between two and three completely separated, forming an oval spot, the costal and inner marginal portions enclose pale edged black marks; some blackish interneural marks between basal patch and medial band; submarginal line white, indented on costal area where it edges two blackish marks, thence represented by more or less distinct lunules; a blackish spot on the outer margin from apex to vein four, inwardly edged by an irregular, curved, white line; some blackish marks between the spot and the inner margin; fringes ochreous brown, darker mixed at base. Hind wings whitish brown, suffused with fuscous except on the costal area; postmedial line pale, wavy, not extending to the costa, preceded by some blackish marks on the inner margin; submarginal line pale, only traceable from inner margin to vein four.

Expanse, 46 millim.

Collection number, 836.

One male specimen from Daitozan (8500 ft.), September 19th, 1906.

Near *C. melancholica*, Butler.

Xanthorhoë costata, sp. n.

Fore wings whitish, with several obscure, wavy, fuscous, transverse lines; basal patch brown, outer edge almost straight, but indented above middle; medial band brown, extending only from costa to vein five, and contracted just above that vein; submarginal line white, only distinct near the costa, where it traverses an obscure band-like shade which is brownish on the costa. Hind wings whitish, without markings. Fringes white chequered with brownish.

Expanse, 24 millim.

Collection number, 825.

A female specimen from Daitozan (8500 ft.), Sept. 11th, 1906.

In general appearance this insect resembles *P. biplagiata*, Warren.

(To be continued.)

ON TWO UNDESCRIBED GENERA AND THREE NEW SPECIES OF ICHNEUMONIDÆ FROM BORNEO.

BY P. CAMERON.

HEMIPHATNUS, gen. nov.

Radius and cubitus almost united at the areolet, the only (the basal) transverse cubital nervure being not much longer than thick; the recurrent nervure is received shortly beyond it; the transverse median nervure is received behind the transverse basal. Transverse cubitus in hind wing broken near the top of the posterior third. Metanotum smooth, with one transverse keel near the base; the spiracles longish oval. Basal two abdominal segments long and slender, the first more so than the second. Thorax about four times longer than wide, the parapsidal furrows deep; the scutellum rounded, not raised above the mesonotum, head wider than the mesonotum, obliquely narrowed behind. Clypeus separated from the face, its apex bluntly rounded. Antennæ long and slender, not ringed with white, the basal joints of the flagellum long. Claws small.

The type of this genus is a much more slender insect than the majority of the Mesostenini, especially as regards the abdomen and the antennæ. Characteristic also is the very smooth body, including the metanotum. Of the Malay genera, its nearest ally seems to be *Lactolus*, which, however, has the thorax striated, the antennæ thicker, and the areolet is much larger and closed at the apex.

Hemiphatnus nigripalpis, sp. n.

Entirely smooth and shining, yellow; the antennæ, palpi, mandibles, middle of front broadly, the occiput, except for a triangular spot (the narrowed end below) at the eyes, the pronotum except narrowly at the apex, a large triangular mark on the upper half of the propleuræ, its narrowed end at the base, the mesonotum, the metanotum at the base behind the keel, the extreme base of the first abdominal segment, black; the apical three-fourths of first, second abdominal segment, the basal half of the third, more than the basal half of the fourth, and the other segments above, brown. Wings hyaline, the stigma and apical nervures fuscous, the basal nervures black. ♀. Length, 13 mm.; terebra, 2 mm.

Kuching, Borneo (John Hewitt, B.A.).

Legs pale yellow; the four anterior femora black behind, the apices of all the tibiæ (almost the apical fourth), the extreme base of the posterior and the tarsi, black; the hind femora brownish black; the tibiæ and tarsi shortly spinose. Hind coxæ about four times longer than thick. The furrow on the lower part of the mesopleuræ is roundly curved and smooth. The brown colour on the basal abdominal segment is blacker than it is on the others.

TALORGA, gen. nov.

Wings without an areolet, the transverse cubital nervure short. Radial cellule long, reaching to the apex of the wing, the radius

issuing from the middle of the stigma. Transverse median nervure interstitial. Transverse cubital nervure in hind wing broken shortly below the middle. Eyes large, converging below, extending close to the base of the mandibles. Clypeus not separated from the face. Temples short, the occiput not margined. Parapsidal furrows distinct. Scutellum large, the sides distinctly keeled. Metanotum long; there is a distinct longish areola; the spiracles minute, round. First abdominal segment slender, roundly curved above. Legs longish, the tibiæ and tarsi thickly spinose; the two hind calcaria long; the longer fully one-third of the length of the metatarsus. Claws not pectinated. Face aciculated, raised in the centre. Cheeks smooth. Occipital margin entire. First abdominal segment with lateral keels which extend to the tip. Abdominal segments two to four more than twice longer than wide. Areola joined to the base of the metanotum by a keel; sharply pointed at the base, becoming gradually widened to shortly beyond the middle; there is a rugose area, as long as wide at its apex; the sides, outside the spiracles, are bounded by a keel. Mandibles short, of equal width, the apex broad, bidentate. The last joint of the hind tarsi is shorter than the third, as long as the fourth.

Belongs to the Tryphoninæ, tribe Mesoleptini. Without a female it is not easy to settle its exact relationship, but the very large eyes, distinct parapsidal furrows, strongly keeled scutellum, and strongly spined tibiæ and tarsi appear to be characteristic features.

Talorga spinipes, sp. n.

Black, shining, the metathorax finely, closely punctured, the basal segment of the abdomen finely, closely striated; the mandibles, palpi, and legs rufo-testaceous; the base of the coxæ broadly infuscated; the wings hyaline, the stigma and nervures fuscous. Flagellum of antennæ densely covered with longish fuscous pubescence; the apical joints are fuscous. Ventral surface of abdomen testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Palmerella longispina, sp. n.

Black, the basal two joints of the flagellum of antennæ, the fore legs, except the coxæ and trochanters, fuscous, the middle femora and tibiæ of a darker fuscous colour, the palpi testaceous, the third joint of the hind tarsi except at the base, and the fourth whitish; wings hyaline, the nervures and stigma black. Face closely, strongly punctured; between the antennæ is a smooth, shining plate, widest in the middle, from where it becomes gradually, obliquely narrowed to the base and apex. Occiput smooth and shining. Thorax more coarsely punctured than the head, the scutellum much more coarsely punctured than the rest of it; it is sparsely haired; on the metanotum the punctures run into reticulations, as they do also on the metapleuræ. Coxæ closely, strongly punctured, the under side of the hinder densely covered with white pubescence. Pleural furrow deep, curved, crenulated. Genitalia large, white. ♂. Length, 6 mm.

This species is smaller than *P. nigra*, Cam., the type of the genus; the two species may be separated thus:—

| | |
|--|---------------------|
| A square white mark on centre of face above, the front with a distinct longitudinal keel, the basal segment of abdomen distinctly punctured. No plate between the antennæ. Length, 8-9 mm. | <i>nigra</i> . |
| Face immaculate, the front without a distinct keel, the basal segment of abdomen smooth. A smooth, angled plate between the antennæ | <i>longispina</i> . |

NOTES BY THE WAY.

EXCEPTING a few small groups of insects, no museum, public or private, in this country can compete in the extent of its collections with that at Cromwell Road, which has recently made such strenuous and entirely effectual efforts under the jurisdiction of Mr. C. O. Waterhouse, I.S.O., to bring the valuable material possessed by it up to date. We are delighted to find that, at the expiration of his term of office, Mr. Waterhouse is voluntarily continuing his good work in the Public Insect Gallery. Another vacancy has been caused by the deplorable nervous breakdown of Mr. Heron; but both posts are already filled—by Mr. Edwards, who is taking charge of the British Diptera, and Mr. Blair, to whom Mr. Gahan has been obliged, by the press of his official business as Assistant-in-Charge of the Insect Department, to very largely resign his work on the Coleoptera. The new administrative note is, however, struck by the acquisition of three Permanent Assistants; and our honoured Editor has also consented to join the good work as a Special in his particular branch.

No man has time, and few have the inclination, to work the whole of Entomology. Literature is so vast nowadays that there will never be another Westwood. Indeed, it is quite as much as the average stay-at-home man, working his own branch, can do to follow the researches of various scientific missions sent out by those in authority (that is to say, with spare cash) to more or less remote and entomologically unexplored districts. The nearest one now in progress is to be completed during the coming summer, and the results will shortly appear in the 'Transactions of the Royal Irish Academy.' This is a general survey of tiny Clare Island, off the west coast of Mayo, battered by every storm thundering three thousand miles across from New York, till it has become so eroded as to be perpendicular for two thousand feet or so on its north-west front, and thence falling away to sea-level on the south-east, where is the only scrap of

wood, stunted and wind-swept, on the island. It is an unproductive spot, with a scanty and not very interesting fauna; the insects are rare, and no peculiar species have yet been reported. Much interest, nevertheless, attaches to so remote a spot, and the results, taken in conjunction with the recent reports from Lundy in a contemporary, from the Isle of Wight by Mr. Morey in 1908, and from the Scottish islands, will add considerably to our knowledge of insular selection.

The entirely distinct characters of the Entomological Club and the Entomological Society are most happy in so far avoiding friction as to render each reciprocally useful. At the annual gathering of the former, under Mr. Verrall's ever-genial presidency, at the Holborn Restaurant on the 17th ult., a record number of guests was assembled, extending to about eighty suppers. Quite a novel situation was freely discussed; never before, we believe, has a president-elect of the Society died before entering upon his office, and the question arises who should fill his place. In view of the forthcoming most important International Entomological Congress at Oxford, which will fall into the term of this presidency, it is quite necessary that our leader should be of both international reputation and considerable resources, in order to fittingly uphold the prestige of our premier society. Equally worthy as are a few of the other names suggested, we have not the slightest hesitation in stating that one is pre-eminent in both these respects—the Hon. Walter Rothschild.

C. M.

NOTES AND OBSERVATIONS.

CHÆROCAMPA NERII AT EASTBOURNE.—While staying at Eastbourne in August last, word was brought to me that a specimen of *Chærocampa nerii* had been taken by one of the bathers off the pier-head, but I could get no very clear account of it at the time. Recently, however, I have got into touch with the actual captor, Mr. Arthur C. Hillman, of Sussex Gardens, Eastbourne, to whom I am indebted for the following detailed account of its capture. He writes as follows:—"From memory it was on Monday, 15th August last, at about 7.30 a.m., that I was bathing in the sea from the pier-head; I was a few yards out when my attention was drawn to a leaf-like object floating on the water at a short distance from me. I swam to it and found a fine moth; it was alive, its wings being raised up over its back, and it readily clung to my hand; it did not, however, make any attempt to fly, and after I landed with it on the pier a close examination showed that it was in a very feeble condition. I took it home and kept it in a cardboard box in which some moist brown sugar was placed. At night I removed the lid of the box, and next

morning found the insect on the window-curtains, it evidently having revived. On the following Wednesday or Thursday I handed it to my brother-in-law, Mr. Bertram Earp, who is a very keen entomologist, and who identified it as *Charocampa nerii*. The specimen is now in his collection.”—ROBERT ADKIN; Lewisham, January, 1911.

AMPHIDASYS BETULARIA ab. DOUBLEDAYARIA IN ESSEX.—In the ‘Entomologist’ for last year, at p. 204, the Rev. W. Claxton records the occurrence of a female example of this aberration at Navestock, and remarks that it “is perhaps a record for Essex”; so it may be interesting to him and others to learn that in this corner of the county the black variety is by no means uncommon, indeed, it is now as frequent as the type. I came to this neighbourhood in 1886, and for a few years after the larvæ, usually obtained every year, of this insect produced typical specimens, although many of them were often very dark—almost intermediate between the type and *doubledayaria*—and they have become darker and darker every year, and at the present time nearly half the moths reared from the wild larvæ I obtain emerge as *doubledayaria*. A few years ago one of my children found a large female *doubledayaria* sitting on my front door-step, and from her I obtained a quantity of ova. When they hatched, the young larvæ were sleeved upon an ash-tree in my garden, and from these the following year I bred over one hundred moths, more than two-thirds of which were the black variety. The wild larvæ seem to have no particular choice of food, for I have beaten them from every kind of tree and bush, and on several occasions from mugwort, when hunting for larvæ of *Eupithecia succenturiata* at night.—GERVASE F. MATHEW; Dovercourt, Essex, January 14th, 1911.

CORRECTIONS IN NAMES OF THREE SPECIES OF PHYTOPHAGA.—The late Mr. Jacoby in Trans. Ent. Soc. 1897, p. 260, described a *Hermæophaga* as *smithi* from the West Indies. This name has been previously used in the ‘Biologia,’ Supp. p. 262, for a Mexican form. In his second collection Mr. Jacoby had altered the name-label of the West Indian form to *insularis*, Jac. In P. Z. Soc. 1903, p. 284, he describes *Doryphora æneofasciata* from Columbia, on page 291; he inadvertently uses the same name for a Peruvian form. In his copy of the published paper (in my library) the latter name is changed by him to *chalybeofasciata*; on page 287 he uses the name *Doryphora sanguinipennis* for a form from Brazil; he had previously used this name (Entom. 1895, p. 189) for a form from Venezuela; the Brazilian species should be altered to *sanguipennis*.—C. BOWDITCH; Brookline, Mass., U.S.A.

ABNORMAL EMERGENCE OF COREMIA DESIGNATA.—At the beginning of last September I received a batch of ova of this species from the South of Ireland. They hatched on the 14th of the month, and fed up well on cabbage. The breeding-cage was kept in an open shed out of doors, facing the north-east. On December 23rd I was surprised to find four of the moths had emerged, on the 25th another appeared, on 31st another, and another on January 10th. After this I brought the breeding-cage indoors. I cannot understand why

these moths should have thought fit to come out at such an unseasonable time of the year. We had some sharp frosts between November 16th and 23rd; then the weather became mild until the 29th, when it was frosty and cold again for a few days, but from December 3rd to the 25th it was more or less mild and damp, and so I suppose this accounts for it.—GERVASE F. MATHEW; Dovercourt, Essex, January 19th, 1911.

UNRECORDED OCCURRENCES OF *EUVANESSA ANTIOPA*.—Describing the village of Camberwell, where Robert Browning's grandparents settled, and in 1782 their eldest child was born, the late Professor Hall Griffin writes: "The square embattled church-tower . . . stood at the base of the pretty tree-clad slopes of Denmark Hill, Herne Hill, and Champions Hill, amid hedgerows and oak-trees, surrounded by well-stocked pastures and their overshadowing willows and flowers and fruit-trees, which were the haunt of the butterfly. Was not the Camberwell Beauty famous? Indeed, when the Browning household moved to Camberwell, the parish authorities had just been busy 'apprehending' the too numerous caterpillars, and in a single season had secured some four hundred bushels. A generation later, in 1810, Dame Priscilla Wakefield, in her 'Perambulations,' described Camberwell as a pleasant retreat," &c.*

In the hope of discovering the authority for this entomologically amazing statement, I wrote to Mr. Minchin to ask if Professor Hall Griffin had left any note to indicate the sources thereof. Mr. Minchin, however, could throw no additional light on the problem, so at his suggestion I turned to Mrs. Wakefield's 'Perambulations in London,' published in 1814, on the off chance of finding an allusion to this plague of *Antiopa* larvæ! But Dame Priscilla is silent on the subject. "Camberwell is a pleasant retreat for the citizens who have a taste for the country, whilst their avocations call them daily to London"—that is all the information vouchsafed by "Yours affectionately, EDWIN," the imaginary writer of her Letter xxix.

But the mystery is explained to some extent in 'Old and New London; the Southern Suburbs,' vol. vi. p. 279, by Edwin Walford, where, after expatiating on the rural charm of Camberwell, the author transcribes a Vestry Minute, to the effect that in 1782 caterpillars so abounded in the parish that the overseers spent £10 in "apprehending" them, at the rate of sixpence a bushel; the caterpillars being cited as "dangerous to the public in general"; and immediately afterwards Walford mentions that the Camberwell Beauty, "the delight of entomologists, is still one of the finest butterflies of the season . . . It was abundant when Camberwell was a straggling parish." Thus, setting aside the question of the normal abundance of *Antiopa* in Camberwell, or anywhere else in Britain at this time, it is clear that Browning's latest biographer read the same paragraph, and jumped to the conclusion that the caterpillars "at sixpence a bushel" were those of the insect he introduces to emphasize the rusticity of the then suburban London.

* 'The Life of Robert Browning' . . . By Professor Hall Griffin. Completed and edited by Harry Christopher Minchin. Methuen & Co., Ltd., 1910.

Meanwhile, one would like to know to what pest the entry in the Vestry Minute really refers. But unfortunately the record is no longer available on the spot, for, as the present Vicar, the Rev. F. F. Kelly, kindly informs me, St. Giles' Church was entirely destroyed by fire in 1841, and only the register-books of births, deaths, and marriages were saved. Was it *Stilpnotia salicis*? Perhaps some reader of the 'Entomologist' can supply the missing data? —H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, January 10th, 1911.

CAPTURES AND FIELD REPORTS.

SCARCITY OF WASPS IN THE CHESTER DISTRICT. — Wasps in 1910 were extraordinarily scarce in this part of Cheshire. Even in a woodland tea-garden, a few miles up the river Dee, the waitresses told me they had not seen one, although the cakes and other sweets attract the insects from far and near. Queen wasps in spring seemed hardly up to their usual numbers, and I am not aware that any rewards are offered here for their destruction.—J. ARKLE; Chester.

PHTHEOCHROA (ARGYROLEPIA) SCHREIBERSIANA, Fröl., IN GLOUCESTERSHIRE.—I am pleased to be able to record the capture of this very local *Tortrix* in the Forest of Dean on June 23rd, 1910. I netted two specimens flying in the afternoon sunshine about four o'clock amongst some elm trees growing near water. Both were rather worn, and therefore I did not realize what a prize I had at first, but upon submitting one of the moths to Mr. Edward Meyrick, F.E.S., he at once referred it to this species. Previous records appear to be confined to Suffolk, Cambridge, and Hunts.—C. GRANVILLE CLUTTERBUCK, F.E.S.; Heathside, Heathville Road, Gloucester, December 21st, 1910.

LEPIDOPTERA IN THE PORTSMOUTH DISTRICT. —The only other working entomologist within some distance of Portsmouth would appear to be the Rev. Tarbot, of Fareham, and as I am only new to the neighbourhood, I have taken care only to mention those insects which he has not previously captured here, unless possibly it may be in some isolated instance. The capture of a freshly emerged specimen of *Caradrina cubicularis* at ivy on October 17th last might be worth recording, as this would seem to be an exceptionally late date for this species. The following few captures made during the past season might also be of interest, as the majority of the species seem to be more or less new to the district; they were all made in a small wood and marsh stretching for about half a mile below Purbrook, a small village about six miles from Portsmouth, on the main Petersfield road. The gas-lamps from Portsmouth stretch out as far as Purbrook, the last one being situated on a bridge at the edge of the wood, and this light proved especially attractive, a total of no less than ninety-five species being taken there; this number would, I am sure, have been largely augmented had I not been unavoidably absent from home for the greater part of July and August and the whole of May and September. At my first visit to this lamp on

June 1st on my return from Scotland, a very fine *Notodonta trepida* was taken, also *Drepana hamula*, among a host of commoner things, during the course of the evening. Other insects taken during the year were:—*Calligenia miniata* (two), on August 11th; *Lithosia lurideola* and *L. griseola*, which were in the greatest abundance from my return home on July 25th till the middle of August, and shared with *Noctua plecta* and *N. rubi* the distinction of being by far the commonest insects at this particular spot; *Drepana hamula*, one on July 27th, and one on August 15th; *Pterostoma palpina*, one on June 8th, and one on August 12th; *Luperina cespitis*, one taken by a village lad on September 5th during my absence; *Triphæna interjecta*, one on August 6th; *Dianthæcia cucubali*, one on June 11th; *Petasia cassinea*, one on November 26th; *Ennomos erosaria*, one on 5th and one on October 9th; *Geometra papilionaria*, a very fine male on July 26th, a bright moonlight night, the insect having to be chased across two fields before its final capture; *Acidalia imitaria*, one on August 13th; *Numeria pulveraria*, one on June 7th; and *Cidaria silaceata*, not uncommon between August 3rd and 15th. Many other good things were captured, but seem to have been taken more or less commonly in the neighbourhood of Portsmouth before. From the middle to the end of June *Hepialus hectus*, *Xylophasia hepatica*, *Apamea gemina*, *Erastria fuscula*, and *Toxocampa pastinum* were to be taken not uncommonly dusking in the rides of the wood, but it was difficult to pick out the better insects from the hosts of common things that were flying everywhere; *Nudaria senex*, too, was fluttering about in fair numbers among the tall reeds and grasses in the marsh at the end of July and beginning of August. Single specimens were taken of *Xylophasia scolopacina* on July 25th, *Tethea retusa* on August 12th, *Hadena genistæ* on June 27th, *Angerona prunaria* on June 25th.

Sugaring was a complete failure throughout the year, except for two nights, viz. June 25th and 27th, when every patch was simply alive with insects, in a drizzling rain and with a strong "sou'wester" blowing. On these two nights, *Leucania pudorina*, *L. comma*, *Xylophasia sublustris*, *X. hepatica*, *Apamea gemina*, mostly of the var. *remissa*, and *Mamestra anceps* were all fairly common, together with some beautiful varieties of *Miana strigilis* and *Noctua festiva*. Collecting by day did not produce very much worth recording; butterflies of any sort were few and far between, and the Geometers beaten from the hedgerows were mostly those that seem common to the whole district; *Epione advenaria* was perhaps more abundant than usual, and the same thing applies to *Bapta temerata*; *Tephrosia extersaria* was found on an oak-trunk on the 4th of the month, and *Lobophora hexapterata* at rest with extended wings on the garden paling on the 6th. With regard to larvæ, *Diloba cæruleocephala* was simply swarming on the hawthorn hedges at the beginning of June, and the moths appeared in corresponding numbers round the lamps throughout October; full-fed larvæ of *Arctia caia* were frequently picked up crawling across the paths, and a considerable number of *Odonestis potatoria* were found sunning themselves on the long grass under the hedgerows. It now only remains to mention that *Pæcilocampa populi* has been not uncommon during the past month around the

lamps in Fareham.—LESLIE H. MOSSE ROBINSON : 2, Margaret Villas, Portchester, December 28th, 1910.

COLLECTING AT KENDAL (WESTMORLAND).—Continuing my notes (*vide* Entom. vol. xliii. p. 252) on the season's work in the Kendal neighbourhood, I am able to report considerable activity amongst our local lepidopterists during the latter half of the year 1910, accompanied by the acquisition of a wider knowledge of the habits of many species, and by the encouraging addition of one or two fresh names to our list. For several reasons, but chiefly owing to the broken state of the weather, collecting throughout July was of a more or less desultory nature. Several expeditions were made between July 3rd and 9th to some high-lying marshy ground in quest of *Argynnis selene*, but the resulting captures were disappointing. Three journeys for a total of nine specimens, and this in a haunt where it has been found some years literally in hundreds. *Larentia cæsiata*, showing considerable variation, was common in the same neighbourhood, resting in the daytime on the boulders and rock-faces, sometimes a dozen or more in one sheltered corner. Generally they were pretty active and rose quickly at one's approach. Some were stalked till they came to rest on the heather, and invariably these were found to be quite fresh—the worn insects remaining on the rocks, more reluctant to rise. Males of *Phothedes captiuncula* were taken freely in early July resting on the flowers of ox-eye daisy. One specimen was reported as early as June 17th. Females of *Nemeophila russula* were still to be taken in good condition on July 17th, though males of the same species had been netted fully a month earlier. On the 18th, fifteen very young larvæ of *Dicranura furcula* were discovered on sallow—all on the lower branches quite close to the ground. The young larva sits on a silken pad in the centre of the upper side of the leaf and is easily seen. In several cases the empty egg-shell was observed on the *under side* of the same leaf. On July 19th, my friend, Mr. G. Holmes, reported taking some nice *Aphantopus hyperanthus* and *Argynnis aglaia*, one of the latter being a small dark female. July 27th saw two more *Notodonta dictæoides* in the pupa-cage, an interval of eleven days having elapsed since the last emergence. They vary in the depth of chocolate coloration on both thorax and wings. I have one bred specimen, a male, quite grey and hoary. On the night of the 27th two *Noctua dahlî* turned up at sugar. About this date *Melanippe sociata* began to appear, and my series includes some with a very distinct and almost black median band, strongly marked, as in *M. galiata*, and without the customary indefiniteness of *M. subtristata*.

August 1st broke out fine and sunny, and we spent the morning amongst *Erebia æthiops*, which we found to be just beginning. Only one female was netted; they are usually a good week later than the males. This species varies greatly from year to year in the matter of size. On August 2nd several good examples of *Anaitis plagiata* were netted. Larvæ of *Phalera bucephala* were very abundant in early August—birch, sallow, oak, and lime being apparently the favoured (?) trees. August 11th saw appearing in the pupa-cage some fine imagines of *Cirrhædia xerampelina*, bred from larvæ found

under moss on ash-trunks in May. On the 14th I took a grand series of *Chrysophanus phlæas* on the border of the "moss." Females were in splendid order, but the males had evidently been some time on the wing and selection was necessary. During the day the heather-bloom seemed to be a great attraction, but towards evening, in an adjacent cornfield, numbers were observed resting, with wings opened towards the waning sun, on the ripe heads of the corn, and a pretty picture they presented dotted about the field like so many brilliant flowers. With a solitary exception all were head downwards. The following day I found ten nearly full-grown larvæ of *Vanessa cardui* on nettle. These were sleeved on a bunch of the food-plant, and allowed plenty of light and air. The resulting imagines lack nothing in size, and form a fine series of dark examples, a great contrast to those I have reared from time to time on thistle. All the usual dark markings appear to be somewhat extended, the series of spots on the lower wings run together to form a band, and on the fore wings the marginal black encroaches on the pink in the form of a smudge. In every one the nervures are thick and dark. Half a dozen full-fed larvæ of *Notodonta ziczac* were found on willow, numerous *Hylophila prasinana* on oak, and *Selenia bilunaria* on mountain-ash. Imagines of *Cidaria testata*, *Coremia unidentaria*, *Eubolia limitata*, and *Crocallis elinguaris* appeared at dusk; whilst after dark the heather-bloom or the moss attracted *Noctua xanthographa*, *N. umbrosa*, *N. rubi*, *Hydræcia nictitans*, *Triphæna pronuba*, *T. orbona*, and freshly emerged *Xanthia fulvago*. With the exception of the last, a very sluggish insect, most of the Noctuæ are shy, and fly off or drop as one approaches. A net is a useful accessory when working heather, and prevents the ultimate escape of many an insect. Sugar and the ragwort flowers in the vicinity of the heather-bloom were entirely neglected. One specimen of *Epione apiciaria* was netted about 10 p.m., and on subsequent evenings several more were found sitting quietly on the lower leaves of the willows, and generally well under the bushes. When disturbed, they fluttered gently to an adjacent leaf and settled down again. Until this season we have been accustomed to look upon *E. apiciaria* as a rarity in our district, but this capture only proves what one often suspects, that many so-called rarities have gained the reputation simply through our ignorance of their habits. *Hypsipites sordidata* swarmed around the willows after dark, but were mostly far worn.

On the 18th I paid a visit to an old haunt of *Pararge megæra*, a rapidly disappearing species with us. On this occasion, fortune, represented by the sun, frowned. I certainly saw one *megæra*, but before I could dismount from cycle and unfurl the net, it had disappeared, and with it the solitary gleam of sunshine. Heavy clouds were quickly gathering, but being in the neighbourhood, I risked a probable wetting for the sake of hunting for larvæ of *Cucullia asteris*. An hour's search produced two! Last year I found thirty in half the time. On the 21st we started larvæ-beating in earnest, determined this year to give the birches on the mosses a thorough working. Ten *Notodonta dictæoides* (some very small, the largest only half an inch in length), six *Geometra papilionaria*, one *Acronycta leporina*, and numbers of young *Notodonta dromedarius*, *N. camelina*, *Drepana*

falcataria, *D. lacertinaria*, *Cabera pusaria*, and a few small *Amphidasys betularia* comprised the first morning's bag. The following day added seven *N. dictæoides* and nine *G. papilionaria*, together with the other commoner species. Solitary trees proved best for *N. dictæoides*, although an outstanding lower branch of the larger birches (growing often in groups) occasionally held them. *G. papilionaria* at this date were very small and difficult to see on the tray. Several young larvæ of *N. camelina* were puzzling, inasmuch as the usual plain green dorsal surface was studded with small shining black tubercles, and the head was figured with two conspicuous eye-like marks. Three of these larvæ were kept separate from the rest, and produced later the pink form of the adult larva. Throughout August and September we beat the birches, with the result that a goodly quantity of larvæ were taken. *Notodonta dictæoides* and *Geometra papilionaria* were neither of them uncommon; *Notodonta dromedarius* and *Lophopteryx camelina* were abundant, but more than half of them "stung." *Drepana lacertinaria* was this year more plentiful than *D. falcataria*, though the converse is usually the case. *Cabera pusaria* was everywhere, showing four or five distinct forms. *Cidaria corylata* we added in late September, one of the larvæ being a pretty coral pink, bright on the ventral surface, somewhat paler on the back. Some of the *Geometra papilionaria* on September 18th were surprisingly big, and showed quite a lot of green on the sides. If not sleeved outside for the winter, they require to be fed as long as a vestige of green remains on the trees, and when leaves fail, they eat the birch-catkins readily. By now, November 18th, my larvæ have fixed themselves firmly to the twigs, appear to have shrunk considerably, and have assumed the duller brown tint of the birch bark.

Two enthusiastic entomological friends, Messrs. A. Graveson and T. Smith, sugared persistently throughout August in the hope of arousing again *Aplecta occulta*, examples of which they had been fortunate enough to take last season. But "sugar" during August was this year disappointing, and a solitary *Orthosia suspecta* was the only capture worth noting. On heather-bloom, however, they secured a nice series of *Noctua glareosa*. One night they reported seeing quite a number of toads sitting boldly on the heather-tops, obviously waiting for the supper which the winged visitors should provide—no wonder some species are becoming scarcer! Four imagines of *Ennomos alniaria* were bred on August 23rd from larvæ beaten from birch on the moss in May. About this date, *Neuronia popularis* and *Choreas graminis* were common on the street-lamps. The weather of the latter half of August was impossible, and outdoor work came to a standstill. September opened fine and the prospect improved. *Polia chi* was again abundant. The lighter forms are well protected on our local limestone, but on the blue-stone walls of the Windermere district they are conspicuous and unmistakable. I have never taken the var. *olivacea* here. On September 3rd a number of larvæ of *Spilosoma fuliginosa* were discovered on the roadsides, and they are now in hybernation. On the 7th a much worn female of *Calocampa solidaginis* was captured on heather-bloom. This is an insect new to the district, but will, in all probability, be found commonly if

looked for at the right time. The same night a solitary male *Oporabia filigrammaria* was netted flying over the heather. *Tapinostola fulva* flew commonly over the marshes in the evening, 5.30–7 p.m., but was beginning to look worn by September 15th. When they settle, they go right down to the roots of the grass and sedge, and are extricated only with difficulty. An odd specimen of *Celæna haworthii* was taken, but no *Agrotis agathina*, although the latter occurs. A considerable number of a long white-striped green larva were beaten from Scots fir (*Thera variata*?), but nearly all were “stung.” At the same time, larch yielded the variously tinted larvæ of *Odontopera bidentata*, several *Macaria liturata*, and numbers of *Eupithecia lariciata*, the latter in both forms, the green, however, greatly predominating.

October 4th saw the opening of the “ivy” season. Species noted were *Cerastis vaccinii* and *C. ligula*, both common; *Xanthia circellaris* and *Miselia oxyacanthæ*, showing signs of wear; one *Plusia gamma*; and one *Orthosia lota*—not a brilliant start! On the 6th *Orthosia macilenta* and *Phlogophora meticulosa* joined the above-mentioned species. *Cidaria miata* was flying commonly but somewhat *passé*. *Oporabia dilutata* was also in evidence, but the males were none too fresh. Several larvæ (*sambucata*?) were found suspended by short threads from the ivy-leaves. On October 10th we paid a visit to the oak-wood for *O. dilutata*. The males began to fly at 8.30 p.m., and several freshly emerged females were taken from the oak-trunks and from the heads of grass-stems. It would almost appear that a great number of thread-spinning larvæ allow themselves to drop, when full-fed, direct to the ground rather than descend by way of the tree-trunk; so many insects may be found drying their wings on grass-stems many yards away from the tree-trunk. The same night we took the first male *Himera pennaria*, although this species did not become really plentiful till October 30th, and by November 5th it had disappeared. One specimen each of *Cheimatobia brumata* and *Hybernia defoliaria* were noted on October 10th. October 20th, a bitterly cold night, with strong north wind, so wild and seemingly unsuitable that I hesitated to ask my friends to accompany me, I went down at dusk to examine the ivy-bloom. Moths swarmed! Moreover, they disdained to take advantage of the sheltered flowers, but seemed to prefer the top of the wall, where they were blown about so forcibly by the wind that selection of specimens was well-nigh impossible. *Scopelosoma satellitia* was the only new species, if I except four belated wasps. Certain it is, however, that the “dusk” flights are the strongest. This we were able to confirm at sugar on the 27th. The first round, 5.30 p.m., found several moths on every patch; afterwards, up to 8.30 p.m., not a single new arrival! Only one *Calocampa exoleta* has been taken this autumn, and again no *Agrotis saucia*. On the 27th, male *Hybernia aurantiaria* began to appear; some were found, freshly emerged, on the dead bracken in the wood; later (October 30th, November 3rd and 5th), they could be taken pretty commonly after dark on the twigs of various trees. Several paired examples were captured on November 5th; the males evidently fly just at dusk, and then not again till about 10 p.m.; after November 8th none were seen. About

the same dates *Cheimatobia brumata* swarmed on the birches in the swampy parts of the wood. On October 30th the males flew freely at 9.30 p.m. On November 3rd they were flying just as freely at 8.30 p.m.; whilst on November 8th, a crisp, frosty night, with the grass "crunching" under our feet, not a single specimen was observed flying during the time we were there (8–10 p.m.). Every male had forsaken the twigs, and taken up a position on the thicker stems, with wings pressed closely to the back, although on previous nights the wings had invariably been held together above the back. I have but little doubt that the males of our winter moths carry the females to the trees. Many paired examples may be found on the brackens and sticks lying on the ground some distance away from the birches. The capture of two specimens of *Pæcilocampa populi* on a street-lamp on November 13th brought our season virtually to a close, for since that date the weather has been so severely wintry in character as to prohibit collecting in any shape or form. Viewing the year as a whole, we have been favoured with more than an average share of fine collecting days and nights, and I shall look back upon the season 1910 as one full of interest and enjoyment. — FRANK LITTLEWOOD; 10, Aynam Road, Kendal.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—The Annual Meeting of this Society was held on Wednesday, January 18th, at 11, Chandos Street, Cavendish Square, when the Officers and Council for the forthcoming session, 1911–12, were elected. Owing, however, to the death of Mr. J. W. Tutt, the President-nominate, no successor to the outgoing President, Dr. F. A. Dixey, M.A., M.D., F.R.S., was chosen, and a Special General Meeting will be held later in the year for that purpose. Meanwhile, the following Fellows were elected to act as Officers and Members of the Council:—Treasurer, Mr. A. H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and, in place of Mr. Rowland-Brown, M.A., who resigns after eleven years' service, the Rev. G. Wheeler, M.A., F.Z.S.; Librarian, Mr. G. C. Champion, F.Z.S.; other members of the Council, Mr. R. Adkin, Mr. G. T. Bethune-Baker, F.Z.S.; Professor T. Hudson Beare, B.Sc., F.R.S.E.; Mr. M. Burr, D.Sc., F.L.S., F.Z.S.; Dr. F. A. Dixey, M.A., M.D., F.R.S.; Mr. H. St. J. Donisthorpe, F.Z.S.; Mr. J. H. Durrant; Professor Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Mr. A. Sich, Mr. J. R. le B. Tomlin, M.A., and Mr. H. J. Turner.—The President, in the course of his Address, after referring to the losses by death sustained during the preceding year, went on to speak of various events of special interest to entomologists, among these being the appointment of Professor Meldola, F.R.S., as Herbert Spencer Lecturer, and Mr. Selwyn Image as Slade Professor of Fine Art at Oxford; the award of the Royal Society's Darwin Medal to Mr. Roland Trimen, F.R.S., and the meeting of the first International Congress of Entomology at Brussels. He then proceeded to deal with certain problems of general biology on which special light had

been thrown by entomological study, notably the demonstration that permanent races, differing from the parent stock, could be produced by artificial interference with the germ-plasm. This had been surmised from early experiments of Weismann, followed by Standfuss and Fischer, and had now been placed beyond doubt by the careful work of Tower in America, who had also shown that the new form might stand in Mendelian relation with the stock from which it sprang. Other topics touched upon in the Address were the psychophysical character of the material presented to the operation of natural selection—a point particularly emphasised by Professor Mark Baldwin; and, in connection with this, the special interest attaching to the communities of the social Hymenoptera, where the group rather than the individual appeared as the unit of selection.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held *November 21st*, 1910, at the Royal Institution, Liverpool. Dr. P. F. Tinne in the chair. — Mr. H. R. Sweeting, M.A., read a paper on “Collecting in the North of Ireland during August, 1910.” In this period only eight whole days were free from heavy rain, and in consequence of the unfavourable weather the results were much below what one might reasonably expect under good conditions. The outstanding feature of the holiday was the capture, on a private estate, of a long series of *Hydræcia crinantis*; the moth was identified by Mr. F. N. Pierce, who examined all the specimens while the bodies were yet soft enough to permit an inspection of the genitalia. A series of *Cidaria truncata* contained the usual forms, and also a very fine melanic variety of the *centum-notata* form wholly suffused with fuscous, the hind wings being nearly as dark as the primaries; other specimens also had a strong melanic tendency. A series of *Noctua dahlii* contained some almost black examples. The butterflies were noteworthy as showing distinctly brighter colouring than is usually found in England. *Lycæna icarus*, unfortunately, was not met with; the females from this locality, as is well known, have very bright blue coloration. The paper was illustrated by a large scale-map of the district, coloured to indicate the collecting areas, a feature which added greatly to the interest of the descriptions. A discussion ensued, in which several of the members present gave their experiences in the North of Ireland.—Mr. W. B. Crabtree exhibited two aberrations of *Nemophila plantaginis*, male and female, in which all the black markings were replaced by orange, the ground colour of the fore wings being pale straw-colour, while the hind wings were unicolorous orange; they were taken wild on a mountain near Helvellyn. The same member also showed a variety of *Euchelia jacobææ*, in which the usual red markings were smoky black sparingly intermixed with crimson; this very striking specimen was bred from a larva found at St. Anne's-on-Sea.—Mr. A. W. Boyd showed a large number of Micro-Lepidoptera taken in various parts of Cheshire during 1910.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

OBITUARY.

JAMES WILLIAM TUTT died at his residence, Rayleigh Villa, Westcombe Hill, where he had lived since 1885, on January 10th, 1911, and was buried in the Cemetery at Lewisham on Saturday the 14th. A large number of colleagues were assembled with the family at the graveside, and wreaths were sent by the Entomological Society of London, the South London Natural History Society, the South Eastern Union of Scientific Societies, and a host of private friends and admirers; while special delegates were present as representatives of the several Societies with which he had been so closely associated.

Mr. Tutt was only in his fifty-third year, having been born on April 26th, 1858, at Strood, in Kent, where he was educated at the St. Nicholas Schools from 1865 to 1875, after which time, having determined on the scholastic profession, he proceeded to St. Mark's Training College, Chelsea (1876-77), where he passed Double-First in certificate examinations; obtained from the Board of Education a profusion of certificates; and matriculated in the First Class in the University of London, but did not follow it up to a degree.

He early became Headmaster of Snowfields Board School, and successively of Webb Street School and of the Higher Grade School at Portman Place, and but a few months since was appointed to the new Morpeth Street Central School, the first of a departure in higher grade schools. In all these positions his energy and organizing power were conspicuous, as well as his ability to make the most of the boys under him, though he felt that he was often thwarted by various items that may be summed up as "red tape"!

In an address published in the 'Entomologists' Record,' vol. vi. p. 59, we find a few autobiographical items. He tells us that he was first attracted to entomology at the age of thirteen, and, having followed it up in a boyish way, but, no doubt, with his characteristic energy and acumen, was at fifteen a confirmed entomologist, and though his library was defective, he had, what was decidedly more educative and useful, in the immediate vicinity some of the finest collecting-ground in England—a matter of first importance at that stage of his evolution.

In 1881 he met Mr. Coverdale, a name little known to entomologists, but clearly as enthusiastic, as active, and as fully imbued with the scientific spirit as Tutt himself, some of the Coverdale specimens and preparations in Mr. Tutt's possession remaining to testify to this; while there can be no question but that this association was an important factor in guiding the younger man into the line of entomological work in which he became distinguished. Unfortunately, shortly afterwards Cover-

dale went abroad, and appears to have fallen a victim to some tropical malady. But Mr. Tutt used often to refer to this "guide, philosopher, and friend" with veneration, and Coverdale's communications to the 'Entomologist' in 1885 and the few preceding years show him to have been a man of unusual ability.

It was at this period that Tutt began to send notes to the 'Entomologist,' the earliest being apparently one in 1884 on prolonged pupal duration in *Eriogaster lanestris*. And very soon after he became the most frequent and voluminous contributor, so that it was not long before this outlet for the record of his observations became inadequate, and in 1890 the 'Entomologists' Record and Journal of Variation' was founded under his editorship.

During this period also he was very active as a member both of the City of London and South London Societies, and he joined the Entomological Society of London in 1885. He presided over the City of London Society from 1896 to 1899, and over the South London in 1899. He first joined the Council of the Entomological Society in 1897, and, after three further years on the Council, 1908-10, was President-nominate at the time of his death, and would have succeeded to the Presidency had he lived but a few days longer. Meanwhile his work in helping to place its publishing activities on a more business-like basis was of the highest value to the Society, the experience gained by him in the publication of his own numerous works having equipped him with the necessary grasp of a highly technical subject. He was also very active in the South Eastern Union of Scientific Societies, and edited their 'Transactions,' besides enjoying the privileges as Honorary Member of several Foreign Societies.

His entomological work was extensive and incessant; besides many lectures and addresses to Societies, he edited the 'Entomologists' Record' for twenty-two years, and hardly a number appeared without something from his pen; the papers extended and republished from these, and from contributions to the 'Entomologist,' forming a considerable series, such as the important review of the British Noctuæ in four volumes, the papers on Melanism, on the British Pterophorina, on Migration, &c. His 'Practical Hints,' in three volumes, is to a great extent separate from these. It illustrates something of his method of working, and the unstinted labour he must have bestowed in collecting his material. He seems to have explored with meticulous care the magazines, the various systematic works on Lepidoptera, and, in fact, all accessible published matter, and arranged extracts or made indices, so that he had collected a mass of information available in almost every direction. It was in this way that he successfully brought together the many

scattered observations which enrich his *magnum opus*, the 'British Lepidoptera.'

Mr. Tutt also wrote more popular volumes—on 'British Butterflies' (Gill), and 'British Moths' (Routledge). His three volumes, 'Rambles in Alpine Valleys,' 'Woodside, Burnside, Hillside, and Marsh,' and 'Random Recollections' reveal him not only as a close observer revelling in all scenes of wild Nature, but also as possessing no small poetic inspiration.

But the 'British Lepidoptera' was no doubt the work in which he considered his labours were to culminate, and to which he devoted himself with but too much ardour. Of this, five volumes on Moths have appeared, and the fourth on the Butterflies was nearing completion, and they are noteworthy not only for their encyclopædic character in relation to each species handled, but for the critical discussions on many points of classification and nomenclature. This, however, is not the place for further review, beyond noting the evidence afforded of Tutt's amazing industry, and the width and vigour of his mental grasp.

A detailed list of his works will probably be compiled in due time. Reference has been made to the most prominent of them.

But although every moment of his leisure was occupied with his literary labours, he yet found time to promote the welfare of the Entomological Societies with which he was connected by securing for them many new members. And making all allowance for the spirit and progress of the age, and for no man being indispensable, we certainly owe it to him more than to anyone else that British entomologists are more numerous and take a more scientific view of their studies than was the case twenty years ago.

I first made Mr. Tutt's acquaintance in connection with his papers in the 'Entomologist' on British Noctuæ, and recognized in him the realization of a keen and scientific intelligence, very rare amongst the entomologists I knew. It was later that I discovered he possessed in an extreme degree that fundamental quality of genius, the capacity for taking pains. It was simply impossible for him to be idle; he must work away at full steam all the time. He was a born schoolmaster; he must be learning himself or teaching others. He could expound *extempore* any subject he was studying, and seemed absolutely fond of writing. One wondered, as he taught so much, how he had time to learn anything, till one realized how rapidly he could understand and assimilate new material, how instantly he assigned it its proper value and position amongst the rich stores of his memory, and how rarely he was wrong, though for the majority only the most superficial judgment of the matter would have been possible in the time. On the rare occasions when he did fall into error, he was willing to correct his position without

the slightest reluctance. But he had very little patience for opinions which he saw to be erroneous, no matter in what way ; and in his earlier days his contemptuous onslaughts at times gave offence to persons who thought he was attacking not their errors but themselves. In spite of this characteristic, perhaps truly associated with it, was his remarkable power of enlisting the efforts of all and sundry, both in the service of entomology simply or in assisting himself in whatever subject he was occupied with. Whilst thus claiming and securing the co-operation of others, he was always ready to help them as far as he could, and when he failed to do so it was rarely from other cause than absolute want of time, and for his friends or anyone who asked his assistance he strenuously exerted himself, not seldom at considerable self-sacrifice.

I had the pleasure of accompanying Tutt on his first visit to Scotland and his first tour in the Alps, and his keen appreciation of and unbounded pleasure in the new experience were most exhilarating. His interest in European insects had already been awakened, but henceforth the study of the palæarctic rather than the mere British fauna seemed to occupy him. His extensive collections, occupying some dozen cabinets, are less remarkable for the rarities they contain than for presenting many long series, and for being very largely of his own collecting. It is stated that they are to be disposed of during the next two years.

Mr. Tutt began life with a serious cardiac disorder, which he was not expected to get over ; complete accommodation, however, took place, and for most of his life it could hardly be said to handicap him in any way. Nevertheless, it is probable that of late years over-work—and I have already said that it was impossible for him to be other than hard at work—and an East End atmosphere were answerable, owing to the heart weakness, for the various illnesses which culminated in the fatal attack.

His death is a great loss to entomology : besides the loss of his own work, a source of energy animating others and collating their work disappears. His death is impressively disastrous in so far that it occurred when he was at the height of his powers, and with apparently many years of productive activity before him, and the irony of fate culminates in his having been about to assume the Presidency of the Entomological Society of London.

Mr. Tutt married Frances Marsh Collins, of Rochester, and leaves two sons and three daughters, of whom several have already left the parental home, two being married.

T. A. C.

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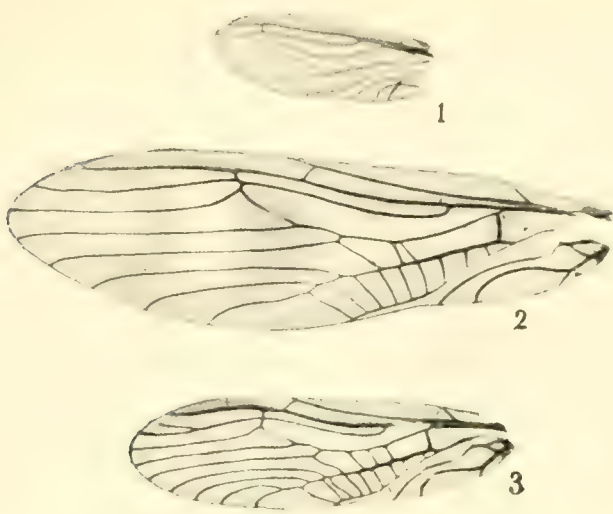
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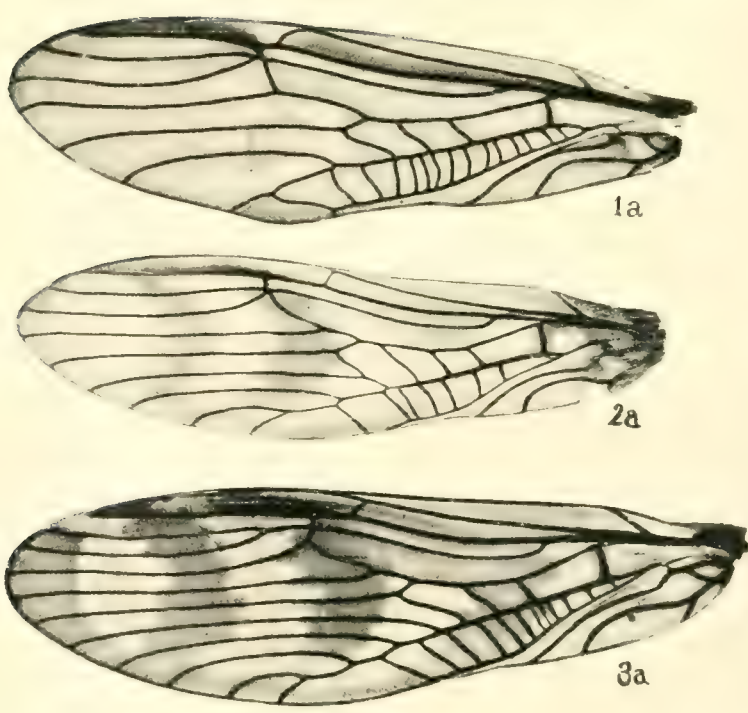
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MALES.

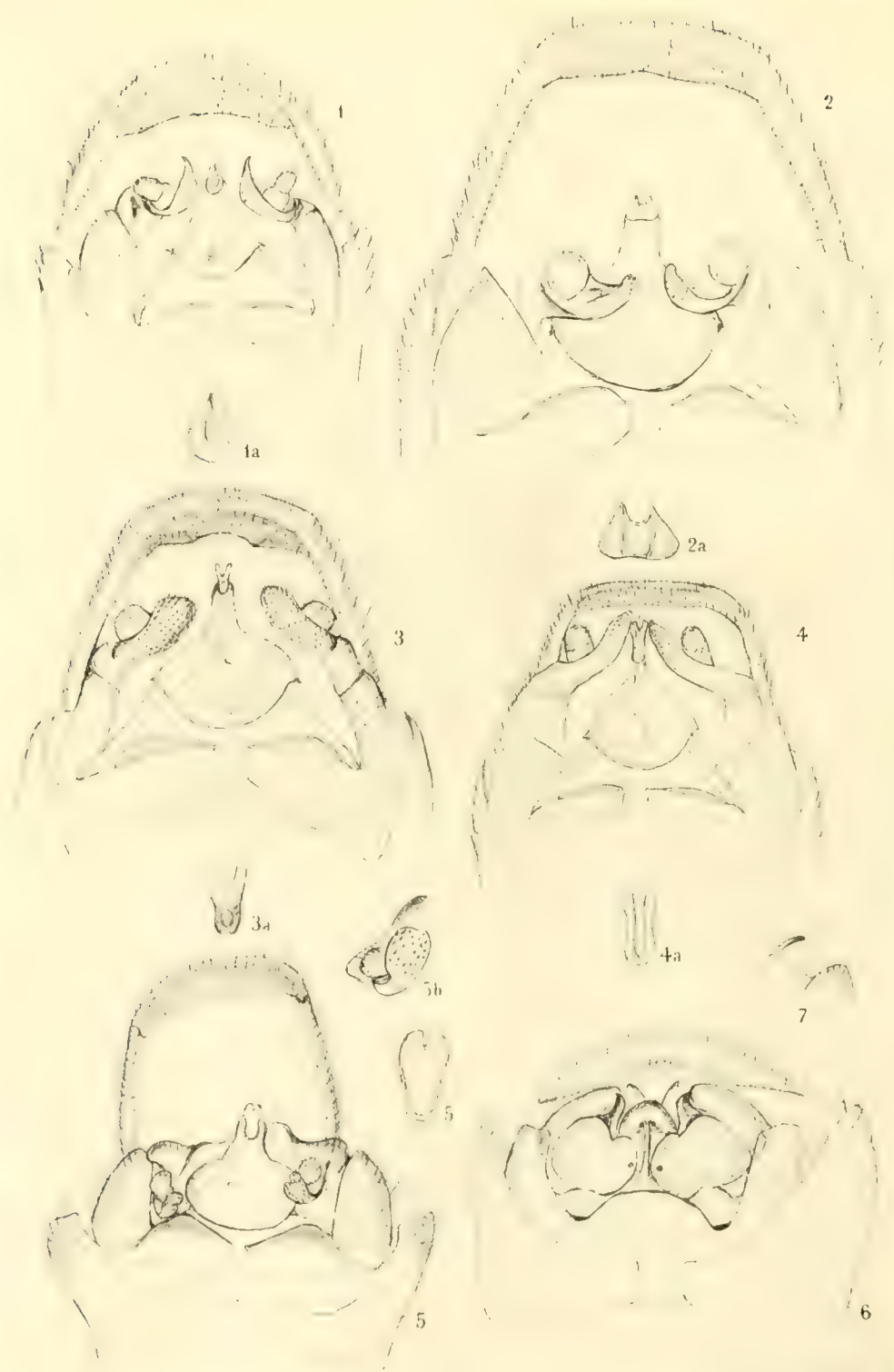


FEMALES.

Dr. Fr. Ris photo.

West, Newman proc.

FORE WINGS OF TÆNIOPTERYX.



K. J. M. del.

West. Newman proc.

THE GENUS TÆNIOPTERYX.

THE ENTOMOLOGIST

VOL. XLIV.]

MARCH, 1911.

[No. 574

ON *TÆNIOPTERYX PUTATA*, NEWMAN (PLECOPTERA), WITH NOTES ON OTHER SPECIES OF THE GENUS.

BY KENNETH J. MORTON, F.E.S.

(PLATES II. & III.)

IN the Trans. Ent. Soc. Lond. 1896, p. 58, when describing *Tæniopteryx risi*, I made some remarks on *T. trifasciata*, Pict., partly based on material from Scotland in my own collection, and partly on Continental specimens received for examination from Mr. McLachlan. The species of the genus were, however, at that time very imperfectly understood, and in the light of what is now known it is almost certain that what I had then before me as *T. trifasciata* did not all belong to the same species. The material is not now available for re-examination. Quite a number of species belonging to the genus have since been satisfactorily separated. At the same time, I am not sure that unanimity of opinion yet prevails as to what constitutes the true *T. trifasciata* of Pictet.

In the paper above-mentioned, the insects from Scotland were certainly what I then regarded as typical *T. trifasciata*. This determination was, I admit, to a great extent due to the fact that both McLachlan ('Catalogue of British Neuroptera,' 1870) and Albarda ('Catalogue des Nevroptères observées dans les Pays Bas,' &c., 1889) had referred Newman's *Nemoura putata* (the type of which was from Scotland) to *T. trifasciata*, Pict. Klapálek, on the other hand, has since put forward the view that the true *T. trifasciata* is to be found in an insect which he took at Vienna, in which the wings of the male are very much more reduced. I have not seen the female of this Vienna insect, but the male is a very different thing from the Scottish representative of the *trifasciata* group. Certainly, on the whole, Klapálek's insect comes nearer to Pictet's figure than does the Scottish insect, to which, as far as I am able to judge at present, the

name of *putata*, Newman, must be applied, if Klapálek's view proves to be right. The final solution of the question will probably rest with the Swiss entomologists, when materials have been obtained from Geneva.

Newman's description of his "*Nemoura putata*" appeared in the 'Entomological Magazine,' vol. v. p. 401 (1838), and his diagnosis (for a copy of which I am indebted to Mr. Herbert Campion) is as follows:—

"*Nemo. putata*.—*Fusca, nitida* ; *antennæ moniliformes, alis fere longiores, et cum pedibus, concolores: alæ fusco-tinctæ, brevissimæ, metatibias sedentis haud dimidio exporrigentes.* (Corp. long. .3 unc. ; alar. dilat. .55 unc.)

"Inhabits Scotland. Taken by Mr. Walker at New Lanark : will form a genus of future authors."

This diagnosis, without material change, is repeated in the 'British Museum Catalogue of Neuropterous Insects,' Part I, 1852, p. 190, but there is nothing there to indicate that the Museum possessed an example. Nevertheless, the presumption is strong that Newman's type went to the British Museum. Professor Lowne, the Curator of the Entomological Club's Cabinets, informs me that he never had either Newman's British or foreign Perlidæ, although he remembers seeing them at Newman's, and he suggests that they went to the British Museum. The late Mr. McLachlan long ago told me that Newman's foreign Perlidæ were in the British Museum, but he was never quite satisfied that the British examples were there, and I suppose the official records throw no light on the point.

Mr. Herbert Campion very kindly made a search in the Museum Collection for this type, but without conclusive results. I suppose it is a well-known fact that Stephens's collection of Neuroptera was at one time arranged by someone who was not quite an expert in the order, and who seems to have been the cause of seriously impairing the value of the collection to future workers. Mr. Campion reports that there are three insects in the British cabinet over a printed label reading: "21 *putata* Newm." Two of the insects, he says, have clearly nothing to do with the present question, but the third is of importance, and Stephens's own MS. label pinned beside it seems to relate to that specimen alone. Mr. Campion is satisfied, after comparing it with one of my males from Clydesdale, that the two belong to the same species. I am much inclined to think that this specimen is either the actual type, or at least that it may have been received from the same source—that is, from Henry Walker, of New Lanark.

While unfortunately it is not possible to get that absolute proof which a comparison with the known type would have

afforded, yet Newman's description can hardly refer to anything else than to my earlier *T. trifasciata*. The locality, New Lanark, refers no doubt to the River Clyde, near that place. The banks of this river, which were my favourite hunting-grounds for many years, produces in early spring two species of *Tæniopteryx*, both of which have short-winged males, but the reference to the moniliform antennæ can apply to my *trifasciata* alone.

The British species of *Tæniopteryx* are three in number, viz. *putata*, Newman, *risi*, Morton, and *nebulosa*, Linné.

Little needs to be said about the last-named, which is separable from the others at a glance. Klapálek has placed it in a separate genus, *Nephelopteryx*. If the two genera are adopted, they may be distinguished thus:—

| | |
|--|------------------------------|
| Cubitus of the fore wings emitting two to four branches outwards to the hind margin. Ventral plate (<i>lamina subgenitalis</i>) of the male long | <i>Tæniopteryx</i> , Pict. |
| Cubitus of the fore wings emitting but one branch outwards to the hind margin. Ventral plate of the male short | <i>Nephelopteryx</i> , Klap. |

In British examples of *nebulosa* the male, as has been indicated, has frequently very much abbreviated wings, but not always so; specimens occasionally appear almost as full-winged as Continental examples. Mr. Martin E. Mosely recently sent me one from Dovedale in full-winged condition. It may be that micropterism is more dominant in the North, but it is probably not confined to that quarter. When the wings are full in the male, it of course approaches in appearance to the female. The shortest-winged males are very remarkable, sprawling creatures, the legs appearing to be out of all proportion to the size of the insect. The short-winged forms seem to have the apical process of the *valvula subanalis* shorter than is usual in the long-winged condition (see fig. 7), but there is no very striking difference, and there may be a certain amount of individual variation. The short-winged male of *nebulosa* may also be separated from the male of *putata* by the moniliform antennæ of the latter. The wing-markings in *nebulosa* are usually very vague, and I cannot say that I have ever seen a female example with such distinct fasciate markings in the wings as are shown in Albarda's figure ('Annales de la Soc. Ent. Belg.' xxxiii. pl. i.). *T. nebulosa* appears very early, from February to April, according to locality and season, and it seems to last but a short time.

The two other species, *T. risi* and *T. putata*, present no difficulty in determination. The latter, as a rule, occurs earlier than *risi*, but *risi* may be found as early as April along with the others, while it continues to appear in higher districts even to July.

The differences between the two species may be tabulated thus:—

MALES.

- a.* Short winged; in fore wing three sectors, as a rule, going from cubitus to hind margin; neuration rather close, and markings in British examples, at least, usually small and faint. Antennæ rather thick, joints moniliform. Ventral plate not produced at the apex, the margin of which is excised *putata*, Newman.
- aa.* Full winged; in fore wing two sectors, as a rule, going from cubitus to hind margin; neuration wider; fasciate markings usually distinct. Antennæ slender, joints not moniliform. Ventral plate produced, up-turned, margins entire *risi*, Morton.
- (For side view of ventral plates, see figs., Trans. Ent. Soc. Lond. 1896, pl. ii.)

FEMALES.

- a.* Wings with three more or less distinct fasciæ, and in addition the apex of the wing is occupied by a well-defined marking which may be connected posteriorly with the immediately preceding fascia, but which is frequently separated therefrom anteriorly by the space between the radial sector and the radius; three or four sectors going from cubitus to hind margin *putata*, Newman.
- aa.* Wings with three more or less distinct fasciæ, but the apex of the wing without any well-defined marking, although the whole apex beyond the outmost fascia may become somewhat darkened in very mature examples. Neuration less close; two or three sectors going from cubitus to hind margin *risi*, Morton.

In the meantime, I cannot attempt to give anything like an outline of the geographical distribution of these insects. Practically the whole material dealt with has been drawn from Scotland, chiefly from Rannoch and Clydesdale. All three abound in Perthshire at the proper time, and I took all of them in Lanarkshire on April 9th and 10th, 1910. I have little hesitation in saying that they occur pretty generally throughout Scotland. No doubt they occur in many English localities.

For *T. risi*, Mr. Porritt gives the following localities: Harden Clough, near Huddersfield, and Dunford Bridge, both in South-western Yorkshire (Porritt); and Buckden in Wharfedale, North-western Yorkshire (Carter). Other localities are Haslemere, Surrey (July), River Yealm, at Cornwood (May 16th), both in McLachlan's collection; and Mr. Briggs records it as rare at Exeter, Bickleigh Vale (Bignell), and not uncommon on East Lyn River (April, Briggs).

T. nebulosa, according to Briggs, has been taken near Exeter (Parfitt), and at Exminster (March, Bignell); and Porritt has it from Pickering, East Yorkshire (February 1st).

The only species known from Ireland with certainty is *T. risi*,

which is common about rapid streams in Co. Wicklow in April (Halbert).

It may be useful to consider shortly some of the allied Continental forms. With this end in view I have made *camera lucida* sketches of the apex of the abdomen from above of several species. These figures are more or less diagrammatic. The figures of the ventral plate serve only to show its outline; no attempt has been made to represent fully the structures lying within the hollow of this plate. The form of the cerci is important and useful, but it appears that allowances must be made occasionally in respect of the position they happen to occupy in each preparation. The remarkable, strongly chitinated vesicle, called by Klapálek the supra-anal lobus (or *valvula supra-analis*), is a very striking feature, and the point of the dorsal appendage of this organ affords good specific characters [cf. Klapálek, "Geschlechtstheile der Plecopteren": 'Sitzungsber. der kais. akad. d. Wiss. in Wien, Mathem.-naturw. Classe,' Bd. cv. Abth. i. 1896, pp. 35-41, Taf. v. (named *T. trifasciata*, but refers to *braueri*)].

Comparing Klapálek's figures of the apex of the appendage of the supra-anal lobus of various species of *Tæniopteryx* ("Ueber neue und wenig bekannte Arten der Paläarktischen Neuropteroiden," p. 11: 'Bulletin internatl. de l'Académie des Sciences de Bohême,' 1901), *T. putata* is a little suggestive of *tristis*, Klap., but this species is evidently different, having only two sectors going from the cubitus to the hind margin. It is very unlikely that *putata* will prove to be restricted to Great Britain. Yet, with one exception, I have never seen anything like it from the Continent. The exception is represented by a pair of *Tæniopteryx* from Czarnohora, in the Eastern Carpathians, received from Mr. Josef Dziedzielewicz: ♂, March 5, ♀, March 15, 1909. These were sent under the name of *T. braueri*, but they do not belong to that species. The male has full wings, but in its structure it comes near *putata*. The female is in a rather curious condition, the apical marking of the fore wings being small, and the subapical crescent hardly indicated at all. It would be interesting to know whether this is an individual variation or normal for the locality. The small apical marking recalls *braueri*, but the facies of the insect is rather different. If I am right in supposing this insect to be *putata*, then the wing-markings are subject to wide fluctuation, and the characters drawn from Scottish specimens will not be universally applicable.*

* I have since received a second pair from the same source. In the female the markings are more normal; the free sectors of the cubitus in the fore wings are respectively two and three. In the male the sectors are two in both fore wings. This form is certainly close to *putata*. In the latter

The other European species of the restricted genus *Teniopteryx* known to me are as follow :—

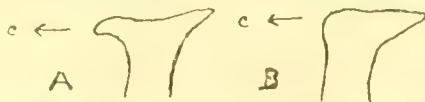
T. braueri, Klap.—This species, like *putata*, has the antennæ distinctly moniliform. The male is, however, full winged. The female is very similar to *putata* female, but the apical marking of the fore wings in *braueri* is apparently always quite isolated. Klapálek states that *monilicornis*, Pict., is a condition of this species, in which the antennæ are strongly moniliform and the wings without any transverse markings. Probably *braueri* will prove to be a widely distributed species. I have seen it from Bohemia (March, Klapálek) and Spain (♂, Jan. 23, ♀, Feb. 11, Navás). Petersen records it from Denmark.

T. trifasciata, Pict. (Klapálek).—The male has distinctly moniliform antennæ; female, antennæ with cylindrical joints. The wings of the male are in a peculiar condition, the fore wing being only about half as long as the hind wing (cf. 'Die Süßwasserfauna Deutschlands (1909), Plecoptera,' by Klapálek, pp. 57–8, fig. 88). The male is known to me from a series from Vienna (March 31, 1899, Klapálek). The female I have not seen; Klapálek describes the wings as "mattgrau, die Spitze und 3 fast gerade Querstreifen dunkler."

T. kempnyi, Klap.—Antennæ setiform, with short joints (somewhat moniliform in the male) in the proximal fifth. Full winged in both sexes. In the female especially the bands are fairly well marked, but perhaps as a rule less conspicuous than in *putata* and *braueri*. Apical spot quite small and isolated. Known to me from Switzerland (Dietikon, March 16, Ris), and Lower Austria (Gutenstein, March and April, Kempny).

T. seticornis, Klap.—Antennæ as in *risi*, slender, with cylindrical joints longer than broad. Full winged in both sexes, the membrane being less grey-looking than in the other species; neuration dark and distinct. Transverse markings small but very distinct; apical marking absent or just indicated by a darkening of the tip. The anal veins in the hind wing sometimes margined with grey, giving these wings a pretty radiate appearance. It is recorded by Klapálek from the Böhmerwald, Riesengebirge, Erzgebirge, and Harz (June and July), and I have received a male from the Eastern Pyrenees (Vernet-les-Bains, April 24–May 9, 1909, Dr. Chapman).

the apex of the dorsal appendage of the supra-anal lobus, seen from side, projects strongly cephalad; this projection is hardly indicated in the Carpathian



male (fig. A, *putata*; B, male from Carpathians; c indicates the direction of the head).

It should be added that *T. nebulosa* and *T. risi* appear to be widely distributed in Continental Europe.

In connection with this paper I have to express my thanks to my ever-obliging friend, Dr. Fr. Ris, of Rheinau, who in the midst of much more important work kindly took the trouble to make preparations of a series of wings, and to photograph them. To British entomologists wishing to identify any specimens of *Tæniopteryx* they may meet with, these wing-photographs cannot fail to prove most useful aids.

EXPLANATION OF PLATES.

PLATE II.

Fig. 1.—*Tæniopteryx trifasciata*. Pict. (Klap.), from Vienna.

„ 2.—*T. braueri*, Klap., from Karlin, Prague, Bohemia.

„ 3.—*T. putata*, Newman, from Scotland.

„ 4.—*T. kempnyi*, Klap., from Dietikon, Switzerland.

„ 5.—*T. risi*, Morton, from Scotland.

In each case, apex of abdomen of ♂ from above.

**a*. Apex of dorsal appendage of supra-anal lobus, from above, more enlarged. 5*b*. One of the cerci of *T. risi*, from above (more enlarged), from another specimen.

„ 6.—*T. nebulosa*, Linn., from Scotland; apex of abdomen of male from above.

„ 7.—*T. nebulosa*, from Lower Austria; apical process of valvula sub-analis (?).

PLATE III.

Fore wings of Male.—Fig. 1. *T. nebulosa* (micropterous form) (nat. length, 4·8 mm.). 2. *T. risi* (nat. length, 10·7 mm.). 3. *T. putata* (nat. length, 6·7 mm.).

Fore wings of Female.—Fig. 1. *T. nebulosa* (nat. length, 12·1 mm.). 2. *T. risi* (nat. length, 11·4 mm.). 3. *T. putata* (nat. length, 13·1 mm.).

* “*a*” accidentally dropped from smaller fig. 5.

ON THE ECONOMY OF THE ICHNEUMONID *MONOBLASTUS PALUSTRIS*, ILLGR.

BY RUPERT STENTON, F.E.S.

On June 10th of last year a female was brought to me of the above Tryphonid, which had been observed by its captor to oviposit in a larva of *Emphytus cinctus*, L. On a supply of these sawfly larvæ being obtained—an easy matter, as they are a serious pest in this Herne Hill district to those possessing valued varieties of roses—and one of them being introduced to the ichneumon, parasitization almost instantly followed. This was effected close behind the head, the operation occupying a few seconds, the larva not making the slightest outward show of objection, though this was certainly exceptional I afterwards found, because a considerable number of larvæ were parasitized by this and another female of the same species during the next

ten days, and they did make what resistance they were capable of, by throwing themselves violently to and fro from side to side during the process of investigation by the ichneumons' antennæ and subsequent parasitization, and would often fall to the ground with the parasite attached, but it was all wholly ineffectual.

On an average about four larvæ were parasitized a day, but very likely more would have been had they been supplied, and no doubt it falls short of the number had the insects been at large.

From one cause or another I lost all my *Emphytus* larvæ in which ova had been deposited except one, parasitized on the day of the first ichneumon's capture. For some time prior to July 27th this larva had been lying quiescent as though dead, which no doubt it was, as on that day the parasitic larva emerged from it, leaving only the shrivelled skin, showing that it had occupied the whole of it. Ordinarily, no doubt, the sawfly larva would have entered a stem of some sort, containing pith, as is their habit, with the intention of pupating, but nothing of this nature was provided.

The *M. palustris* larva was cylindrical, the head and first segment and the two apical segments quite white, the intervening space being green from the interior parts of the creature showing through the skin. There was a very dark green line, bordered by white granules along the dorsal area, throughout the length of the green part, the lateral lines, ventro-lateral lines showing only in the segmental divisions, and a dark ventral line. I counted fourteen segments, including the cephalic one. There was a very slightly discreted border, not very evident. The mouth parts were discreted with fuscous and the antennal tubercles, large, concolorous, and not protruding beyond the level of the head.

The animal had begun to spin some strands of silk, evidently the commencement of its cocoon, presuming this to be a cocoon-spinning species, which it had every indication of being. But I removed it to figure the facial characters, and have found that to do this with larvæ of other species disorganizes them to the extent of incapacity to ever finish the cocoon, as was the case with this one, but it did not result in its ultimate demise as I expected.

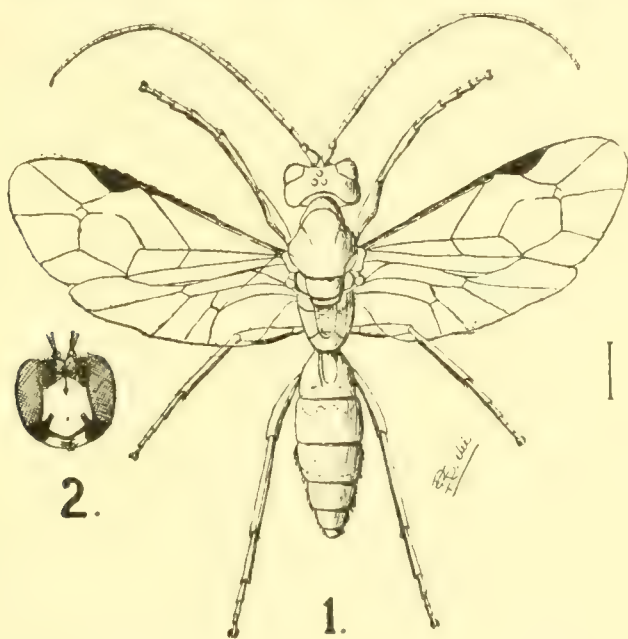
It was now placed in a glass tube, where it spun some silk at each end.

On August 1st signs of pupation began to show, a red spot appearing on each side under the skin of the second body-segment, the eyes of the imago forming, the next three segments showing the contraction for the thorax, now turned to yellowish, the rest white and taking on more of the future imaginal abdominal outline, the extreme apex being buried in a thick black fluid, the larval excreta.

By the morning of the next day there was some more development in outline towards pupation, which then took place. In the evening it had got clear of the black fluid.

Beyond a darkening of the eyes and ocelli there was no visible change until August 10th, when there was a slight clouding of the cheeks and whole thorax, of which the mesothorax and mesosternum were nearly black, as were two marks down the metanotum, and the mandibles red at the tips.

On the evening of August 11th the head, thorax, and coxæ were quite black, a black patch on the dorsal area of the two first abdominal segments, next two clear except two dots on each



1. *Monoblastus palustris*, Illgr., ♂. 2. Face.

ventrally, the rest clouded and marked with black only on the ventral surface (not clouded), with the legs commencing to show colour.

The next morning, August 12th, I found that during the night there had been a considerable darkening of colour all round, the dorsal surface of the third and fourth abdominal segments now being orange, legs more red, antennæ clouding, and mandibles darker.

The following evening, August 13th, there was an exudation of moisture and the pupal skin cast, except from the extreme anal end. By the evening of August 14th this was discarded altogether, and some whitish pellets of exuviae exerted, and in the morning, August 15th, the imago, a male, was running round the tube ready to emerge.

Though the economy of this species, as far as investigated, does not present any phenomena of more than usual interest, it is rarely that any glimpse of what takes place during the early

stages of an internal, presumably, cocoon-spinning parasite is afforded, and Mr. Claude Morley, who kindly determined my insects, has pointed out that as a British species *M. palustris* has up to now only been represented by a single known female in the British Museum, captured by the late Rev. T. A. Marshall at Bugbrooke, Northants.

It would probably be found not uncommonly in the gardens of Herne Hill and district, about the rose trees infested with the host, as five females were taken in addition to the male that was bred, and one female in August, 1909.

I might mention that on July 28th imagines of *Emphytus cinctus* of the second brood began to fly, so that by the time the parasites of the other sex—which would most probably appear in the open about the same time as the bred male emerged—were ready for oviposition there would be, no doubt, a stock of larvæ in readiness.

A SYNONYMIC LIST OF THE PANORPIDÆ OF JAPAN, WITH CORRECTIONS TO MY FORMER PAPER,* AND DESCRIPTION OF A NEW SPECIES.

BY T. MIYAKE.

JAPAN is very rich in scorpion flies. Until now, more than forty species have been described. Navas' papers and mine are perhaps the latest on the subject, and they were issued almost at the same time. Each of us has published twice, and each time mine appeared two or three months later than his. I have no intention of protesting against law of priority as applied to zoological nomenclature, and there is not the least question that Navas' names should be adopted; but I must say that both of my papers were respectively ready for print over one year before they were issued, though their publication was delayed by circumstances which it is not necessary to detail here. This explains why the same species were described by me under names which are now to be relegated to the list of synonyms. The *brachypennis* of my first paper is a synonym of his *nipponensis*, as I mentioned in my second paper, and Mr. Navas in his. Again, in the last paper of Mr. Navas, some species are described which appear to stand very close to some of the species of my second paper, as, e. g., *Panorpa nævia*, Navas, to *Panorpodes apicalis*, Miyake, and *Panorpa limbata*, Navas, to *Panorpodes singularis*, Miyake. Of these, the last-mentioned species, though very closely allied, still appear to me distinct, unless further facts be brought to light, as there are a number of species of our Panorpidæ which are recognized as distinct just by such degrees

* "A Further Contribution towards the Knowledge of the Panorpidæ of Japan," 'Journ. Coll. Agr. Imp. Univ. Tokyo,' vol. ii. No. 3 (1910).

of difference as are found in the above two species. *Nævia*, N., and *apicalis*, M., appear to me to be identical, and *apicalis* must be looked upon as a synonym of *nævia*. If this be the case, then it is very strange that the two species of Navas were put in the genus *Panorpa*. They belong undoubtedly to the genus *Panorpodes*, as may easily be seen from such characters as *short rostrum*, *simple claws*, and many others, and it is still more strange to me that Mr. Navas describes a new species of *Panorpodes* in the same paper.

I must here correct some errors in my last paper. My identifications of *Panorpa lewisi*, M'Lach., and *P. bicornuata*, M'Lach., were erroneous, and I now consider my *chuzenjiensis* as identical with the former, and *magnicauda* with the latter, so that these names should respectively be relegated to the list of synonyms. Again, in the key to the species, *cornigera* was placed by mistake in the *Aulops* group of Enderlein, and of course should have been placed in the *Panorpa* group of the same author.

Navas has made some remarks on *Bittacus sinense* of Matsu-mura and mine, and says, "Il y a lieu à douter si on a pris plusieurs espèces pour une seule." It may be so or may not be so, but at any rate I am making some investigations which I hope will settle the question. In the meanwhile, Navas' opinion is followed in this list. Anyhow, the species of our Panorpidæ already known need further examination as to their specific names.

The following list has been drawn up for preliminary purposes, and will probably need further correction. In the meantime, my own study is being continued:—

PANORPA, Linn.

1. *Panorpa cornigera*, M'Lach., Bull. Soc. Ent. Suisse, 1887, p. 404.
2. *P. communis*, L., Matsumura, 'Senchuzukai' ('Thousand Insects of Japan'), vol. i., p. 164, pl. xi., fig. 6 (1904).
3. *P. gokænsis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 193, pl. xi., fig. 3 (1910).
4. *P. galloisi*, n. spec. (described p. 93).

AULOPS, Enderl.

5. *Aulops japonica*, Thunb., Nov. Ins. Sp. Dissert., iii., p. 67, fig. 9 (1784); Westwood, Trans. Ent. Soc. Lond., vol. iv., p. 188 (1845); M'Lach., *op. cit.*, 1878, p. 183.
6. *A. leucoptera*, Uhl., Proc. Ac. Nat. Sci. Philad., 1858, p. 31; Trans. Ent. Soc. Lond., 1878, p. 186.
7. *A.* ? sp., Hagen, Stett. ent. Zeit., 1867, p. 90; *Panorpa hageni*, Navas, Rev. Russ. Ent., 1909, p. 4.
8. *A. macrogaster*, M'Lach., Trans. Ent. Soc. Lond., 1878, p. 184.
9. *A. klugi*, M'Lach., *l. c.*, p. 185.
10. *A. pryeri*, M'Lach., *l. c.*, p. 186; *Panorpa bouvieri*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 20 (1908).

11. *A. wormaldi*, M'Lach., *l. c.*, p. 186; Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 202 (1910).
12. *A. lewisi*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 402; *Panorpa chuzenjiensis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 201 (1910).
13. *A. bicornuata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 403; *Panorpa magnicauda*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 192, pl. xi., fig. 6 (1910).
14. *A. nipponensis*, Navas, Mem. R. Acad. Ci. Bar. vol. vi., No. 25, p. 20 (1908); *Panorpa brachypennis*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 9, pl. i., fig. 6 (1908).
15. *A. drouarti*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 21 (1908).
16. *A. dyscola*, Navas, *l. c.*, p. 22.
17. *A. ochracea*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 3, pl. i. fig. 9 (1908).
18. *A. sinanensis*, Miyake, *l. c.*, p. 4, fig. 7.
19. *A. rectifasciata*, Miyake, *l. c.*, p. 5, fig. 10.
20. *A. striata*, Miyake, *l. c.*, p. 6, fig. 1.
21. *A. nipponensis*, Miyake, *l. c.*, p. 7, fig. 3.
22. *A. pulchra*, Miyake, *l. c.*, p. 8, fig. 4.
23. *A. trizonata*, Miyake, *l. c.*, p. 9, fig. 11.
24. *A. takenouchii*, Miyake, *l. c.*, p. 10, fig. 5.
25. *A. nikkaensis*, Miyake, *l. c.*, p. 11, fig. 2.
26. *A. ochraceopennis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 190, pl. xi., fig. 1 (1910).
27. *A. obscura*, Miyake, *l. c.*, p. 195, fig. 2.
28. *A. multifasciaria*, Miyake, *l. c.*, p. 196, fig. 5.
29. *A. irregularis*, Miyake, *l. c.*, p. 198, fig. 7.

LEPTOPANORPA, M'Lach.

30. *Leptopanorpa ritsemæ*, M'Lach., Trans. Ent. Soc. Lond., 1875, p. 187.
31. *L. sieboldi*, M'Lach., *l. c.*, p. 188.

PANORPODES, M'Lach.

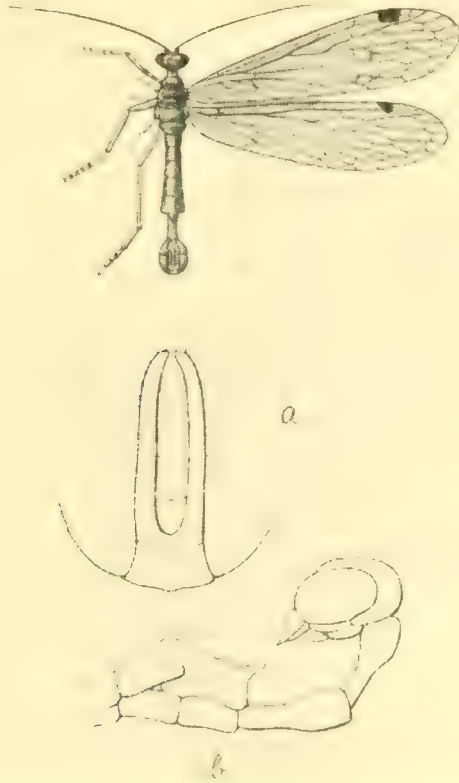
32. *Panorpodes paradoxa*, M'Lach., *l. c.*, p. 189.
33. *P. decorata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 405.
34. *P. nævia*, Navas, Rev. Russ. Ent., 1909, p. 1; *Panorpodes apicalis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 203, pl. xi., fig. 4 (1910).
35. *P. limbata*, Navas, Rev. Russ. Ent., No. 3, p. 2 (1909).
36. *P. notata*, Navas, *l. c.*
37. *P. singularis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 204, pl. xi., fig. 7 (1910).

BITTACUS, Latr.

38. *Bittacus sinense*, Walk., List Neur. Ins. Lond., 1853, p. 469; M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 406; Matsumura, 'Senchuzukai,' vol. i., p. 165, pl. xi., fig. 5 (1904).
39. *B. nipponicus*, Navas, Rev. Russ. Ent., No. 3, p. 3 (1909).
40. *B. lævipēs*, Navas, *l. c.*, p. 4 (1909).

Panorpa galloisi, n. sp. (*Futaten-shiriagemushi*.)

Subcosta of the fore wing extended to the pterostigma, as in *P. communis* and *P. cornigera*. Body blackish piceous; rostrum blackish piceous (slightly shorter than that of our other Panorpidæ), with the palpi piceous; legs testaceous. Wings rather broad (broadest at the pterostigmatal region), whitish with the fuscous veins, with the apex acutely elliptical; the only conspicuous markings (fuscous in colour) are of somewhat quadrate form in the fore



Aulops galloisi, n. sp., male.—a, Appendices; b, Apex of abdomen.

wing and of a triangular shape in the hind wing and are situated at the pterostigma, which is somewhat opaque, occupying its middle one-third; three very insignificant spots found in the fore wing placed obliquely from the pterostigma to the hind margin, the first situated at the middle of the wing and the last at the hind margin.

In the specimen (male) the posterior margin of the third abdominal segment is, so far as I can observe, formed like the other segments, and not produced into a median lobe, as in most of our Panorpidæ. The fifth and sixth segments stout and obconical, the latter is very conspicuous, and bears a short but prominent spine at the middle of the posterior margin; seventh slender, longer, and cylindrical; eighth much more slender and cylindrical and almost equal in length to the former; ninth (cheliferous segment) stout and rounded (not elongated, as in *P. japonica* and others), the chela

shorter than the segment; appendages long and almost parallel, except towards the end, where they slightly approach each other.

Length of body, 11 mm.; expanse of wing, 15 mm.

A male specimen captured at Chuzenji, Nikko, July 27th, 1910, by Mr. Gallois Edme, of the French Embassy.

As this species is new to science, I take great pleasure in naming it after my friend, an enthusiastic collector of Coleoptera, and captor of this specimen, who was so kind as to put the specimen at my disposal to be studied and described.

To a certain degree *P. galloisi* is allied to such European species as *P. germanica*, *annexa*, and others. Of the Japanese forms, however, only *cornigera* and *gokensis* are somewhat allied to the species; but many points, and, above all, the structure of the sixth abdominal segment distinguish it well from the other species.

Zool. Inst. Agr. Coll. Imp. University,
Tokyo, Japan: Oct. 1910.

THE DURATION OF THE LARVAL STAGE IN SOME OF THE SESIIDÆ.

BY LT.-COLONEL C. G. NURSE, F.E.S.

CONSIDERING the mode of life of the larvæ of this family, it is scarcely surprising that our information regarding the duration of the larval stage is scanty and insufficient. It is impossible to watch the progress from the egg to the imago, as may be done with the greater number of Lepidoptera, where the actual number of days between the different ecdyses can frequently be calculated. The following notes are, therefore, offered with a view to inviting other entomologists to place on record their experience regarding the life-history of such species of this family as they are able to study.

The prevailing view appears to be, to quote South's 'Moths of the British Isles,' that "the majority, possibly all, are nearly two years in arriving at full growth." I have personally been able to study, very inadequately, four species, viz. *Trochilium apiforme* and *crabroniforme*, and *Sesia vespiformis* (*asiliformis*) and *culiciformis*.

Of *T. apiforme* Barrett says, "full fed in April, after feeding probably nearly two years." This is not quite accurate, as the larva ceases feeding and spins its cocoon in September or October, though it does not change to a pupa until the following April, as noted by Greene in 'The Insect Hunter's Companion.' Of the total duration of the larval stage I cannot speak with certainty, but I think it reasonable to suppose that the life-cycle extends at least two years, and I should not be at all surprised

if it proved to be three years. The few specimens I have bred have all emerged in July, though Barrett gives the latter part of May and June as its period on the wing.

As regards *T. crabroniforme*; here again I cannot speak with certainty, but I have found the larva still feeding in June, and think it probable that the generally accepted opinion that it feeds nearly two years is correct.

My experience as regards *S. vespiformis* is very much more extensive, and I feel that I can state positively that this species, at any rate normally, completes its life-cycle in one year. As is well known, the larvæ are to be found under the bark of the stumps of felled oak-trees. These trees are invariably felled in the winter; the following summer the females of *S. vespiformis* frequent these stumps, especially those that produce a few shoots, though I have never been able to ascertain exactly where the egg is laid. Larvæ are to be obtained throughout the following winter and spring. To make this quite clear, I may say that the stumps of oaks felled in 1907-8 will, if the insect occurs in the neighbourhood, probably contain larvæ in the winter of 1908-9, and only in rare instances, when the stump is still alive, will a few larvæ be found in the winter of 1909-10. The larvæ seem of all sizes in April and May; indeed, I have found larvæ, pupæ, and imagines on the same day in June. When I first began to study this species, I thought that the smaller larvæ would probably only reach the imago stage in the following year. But the emergence of the imago extends over a long period, viz. from the end of May to the end of August. If a stump be searched, however, in the middle or end of July, no larvæ are to be found, only empty and a few full cocoons. I think, therefore, that I am justified in concluding that the life of this species, from ovum to imago, extends for only one year, and that when, in rare instances, larvæ are found in the winter of 1909-10, in the stump of an oak felled in 1907-8, they are the progeny of imagines that emerged in 1909. It is possible that, as with other species of Lepidoptera, a few pupæ, or even larvæ, may "lie over" till another year, but I am convinced that the normal period during which the larva feeds is just under one year. I may state that during the past five years I have taken over two hundred larvæ and pupæ of this species, and have purposely searched for them at different times, with a view to ascertaining the duration of the larval stage.

I have not had as extensive opportunities of investigation regarding *S. culiciformis* as with *S. vespiformis*. But the former species is to be found in the larval stage in the live stumps of birch the second spring after it has been cut, and not, so far as my experience goes, in the third spring; so I conclude that this species has also a one-year cycle.

Timworth Hall, Bury St. Edmunds: Feb. 12th, 1911.

CONTINENTAL NEUROPTERA, &c., TAKEN BY DR. T. A. CHAPMAN IN 1909 AND 1910.

By W. J. Lucas, B.A., F.E.S.

From time to time Dr. Chapman has been good enough to hand over to me a few neuropterous and other insects which he has obtained on his Continental trips. A list of those taken in 1909 and 1910 is here given. Species that are not British are marked with an asterisk. Mr. K. J. Morton has been good enough to assist me in naming them, and those insects in which he is more immediately interested are now in his cabinet.

AMELIE-LES-BAINS, APRIL 6TH-21ST, 1909, AND VERNET-LES-BAINS,
APRIL 24TH TO MAY 9TH, 1909.

Plecoptera.

**Taniopteryx seticornis*. Vernet.

Nemoura of the group of *marginata* apparently; one each from Amelie and Vernet respectively; both, unfortunately, were females.

Neuroptera.

Hemerobius subnebulosus. Amelie.

Chrysopa aspersa. Vernet.

**Panorpa meridionalis*. Vernet.

Trichoptera.

Hydropsyche pellucidula. Amelie and Bagnial-sur-Mer.

Philopotamus montanus. Amelie and Vernet.

**Rhyacophila persimilis*. Amelie.

**Rhyacophila tristis*. Vernet.

SOUTH OF FRANCE AT VAL D'HERENS, &c. JULY AND AUGUST, 1909.

Plecoptera. Val d'Herens: July 10th-30th.

**Dictyoptyx alpina*.

**Dictyoptyx intricata*.

**Taniopteryx neglecta*.

**Nemoura sinuata*, and probably another species of the same genus, but all are females.

Leuctra inermis.

Ephemeroptera.

**Ecdyurus helveticus*. One male, one female, Val d'Herens: July 10th-30th.

Neuroptera. Val d'Herens: July 10th-30th.

**Raphidia flavipes*. Four females.

Micromus paganus. One.

**Megalomus tortricoides*. Seven.

Chrysopa perla. Three.

Panorpa germanica. Three males.

**Panorpa alpina*. One female.

Trichoptera.

- *Drusus discolor*
**Drusus chrysotus*
**Drusus alpinus*
**Drusus muelleri*
**Drusus melanchætes*
- } Val d'Herens : July 10th–30th.
- *Cryptothrix nebulicola.* Trelechant, Col de Montets : August 6th.
**Potamorites biguttatus.* Val d'Herens : July 10th–30th.
**Sericostoma pedemontanum.* One from Trelechant : August 6th.
 Four from Val d'Herens : July 10th–30th.
Plectrocnemia conspersa. One from Trelechant : August 6th.
 One from Val d'Herens : July 10th–30th.
**Rhyacophila vulgaris.* Val d'Herens : July 10th–30th.

HYERES, ST. MAXIME, BINN, AND HOSPENTHAL, APRIL TO JULY, 1910.

Plecoptera.

Nemoura mortoni. Three females, Hospenthal : July 12th–31st.

Odonata.

Brachytron pratense. One female, Hyères : April 5th–20th.
Pyrrhosoma nymphula. One male, one female, St. Maxime : April 29th–May 11th.

Neuroptera.

Sialis lutaria. Two, Hospenthal : July 12th–31st.
Raphidia notata. One male, Binn : June 20th–30th.
Chrysopa vulgaris. One, St. Maxime : April 29th–May 11th.

Trichoptera.

- *Acrophylax zerberus.* A female, Binn : June 20th–30th.
**Drusus alpinus.* Three females, Binn : June 20th–30th.
**Drusus nigrescens.* A male and a female, Binn : June 20th–30th.
 A male, Hospenthal : July 12th–31st.
**Drusus melanchætes.* Two males and two females, Hospenthal : July 12th–31st.
**Lithax niger.* Seven, one of small size, Hospenthal : July 12th–31st (six of them marked "Gotthard").
**Potamorites biguttatus.* Two males, Hospenthal : July 12th–31st.
**Rhyacophila vulgaris.* A male, Binn : June 20th–30th. [There was also a **Sericostoma* female (probably *galeatum*) from Le Canadel.]

Kingston-on-Thames : February, 1911.

ABERRATION OF *ACRONYCTA RUMICIS* AND *A. ALNI*.

BY RICHARD SOUTH.

HERR M. GILLMER (Ent. Rec. xix. p. 91) describes an aberration of *Acronycta rumicis* as follows :—"It has the basal and marginal areas of the fore wings black, the middle area scarcely darker brownish-grey than in typical specimens; the outer, light, transverse lines obsolete (or suppressed), only the white mark

in cell 1*b* (anal cell) remains; otherwise the insect is typical = ab. *suhrianna*, n. ab. This form is intermediate between the brownish-grey type and the quite black form of ab. *salicis*, Curtis. The specimen is a female, and caught in the Palatinate."

In 'Societas Entomologica,' xxiv. p. 59 (1909), Herr Gillmer figures ab. *suhrianna*, and quotes the original description, with a translation thereof in German. In a footnote it is pointed out that the outer transverse line is not so conspicuous as it appears to be in the figure.

A year or two ago Mr. T. Baxter, of St. Anne's-on-Sea, Lancashire, was good enough to send me a photograph (here re-



ACRONYCTA RUMICIS.—1, aberration; 2, normal.

produced) of an aberrant specimen of *A. rumicis* that he had found on the golf-links in his neighbourhood on July 4th, 1905.

This interesting example seems to be referable to ab. *suhrianna* as described above. The only apparent difference is that, whereas the basal area in *suhrianna* is stated to be black, this area in the Lancashire specimen is traversed by a broad black band which occupies only the outer two-thirds, the basal third of the area being pretty much as in normal specimens. In the figure of *suhrianna* the basal area does not show wholly black right up to the thorax.

In his note, "Captures at Sugar in Yorkshire" (Entom. xliii. p. 228), Mr. Bunce refers to one of the three specimens of *Acronycta alni* as "strongly inclined to melanism." I lately had an opportunity of seeing this specimen, and found it to be an unusual (British) aberration of *A. alni*, closely approaching ab. *steinerti*, Caspari. It may be briefly described as follows:—Head and thorax blackish, the former narrowly edged with greyish, the latter with a few greyish hairs. Fore wings brownish grey, suffused with smoky; black markings as in the type, but the antemedial black line is rather broader; postmedial and submarginal lines a paler shade of the ground colour, the former narrowly edged externally with black; orbicular stigma of the ground colour with black centre and outline; reniform black

with faint outline of ground colour, mixed, in upper portions, with black.

According to Staudinger (Cat. Lep. 1901, vol. i. p. 132, No. 1082), figures of *steinerti*, Caspari, described in 1898 ('Societas Entomologica,' xiii. p. 3), are given—Jahrb. Nass. lii. pl. 4, figs. 8, 9; 'Iris,' xi. pl. 2, fig. 5; as *carola*, Phillips, Jahrb. Nass. lii. pl. 4, figs. 5–7; and as *alni* var. by Barrett, Brit. Lep. iii. pl. 121, figs. 1a, 1b. The last two seem to be modifications of *steinerti*, as also is the specimen secured by Mr. Bunce. The latter, however, appears more heavily suffused than either of the others.

HYBERNATION OF *PYRAMEIS (VANESSA) ATALANTA* IN CAPTIVITY.

BY L. W. NEWMAN.

IN the autumn of 1909 I saved seven specimens of *Pyrameis (Vanessa) atalanta* to see if it were possible to hibernate them in England under unnatural conditions.

I have many times tried them out of doors, also in a cold greenhouse, but in both cases failed, the specimens dying off early in the winter.

I prepared a small cardboard box about nine inches by six inches by six inches deep, cut out the lid, leaving only the frame of cardboard, stretched open mosquito netting over the box, and held this down with the cardboard frame.

The butterflies were placed in this, the box stood by a window facing east, and at night removed to a warmer quarter of the room; there was always a fire in the room, and also a large boiler which was warm all night, so that the specimens never had a lower temperature than, say, 35 degrees, even on the coldest nights. After two or three days they became very restless, and evidently required food. A good-sized pad of absorbent cotton-wool was well soaked in water, sprinkled with cane-sugar, and placed in the centre of the box on top of the mosquito netting; very soon the butterflies had found the sweets and were busy feeding. They walked about in the box, continuously opening their wings when the sun was shining, and about midday retired to the darkest corner of the box.

Throughout the whole winter they fed regularly every few days, and on no day when there was any sun did they remain quiet, no matter how cold the weather was out of doors.

The first casualty happened in December, when a male specimen became quite paralyzed; he seemed to have indulged too freely in food, for his body became very distended, and he lay for many hours at the bottom of the box with legs twitching and wings quivering before he died.

In January the specimens became very tame, and it was my habit to let them fly about in my room on sunny mornings; they would settle on the curtains with wings expanded and sun themselves; they would also feed from my hand, and enjoyed a piece of apple with sugar sprinkled on it, or a banana; they seemed to like the extra space, and the exercise I thought would keep them strong, as they took so much food.

In February I lost a second specimen, which flew into the fire; this left me with only five. All went well, and no more met with unhappy endings during that month.

Early in March I placed them out of doors in the daytime, confined in a roomy cage under a glass-roofed house with open sides, and gave them a pot of growing nettle. No sign of pairing was noted, but in early May a fair quantity of ova had been deposited; these, however, proved infertile, and on examining the specimens I found all were females, the only two males having been the victims of the winter; this greatly disappointed me.

The last specimen lived till the end of May.

I think these observations clear up a point which has long been in doubt, and prove that *atalanta* is not a true hybernator, as it requires food all the winter, consequently this species very seldom, if ever, passes the winter as imagines in England; we are, therefore, entirely dependent on immigration every year for this beautiful though common butterfly.

1910 was a very bad *atalanta* year. Personally, I saw only two specimens on the wing and found but one larva, and heard of very few larvæ or imagines having been seen in England during the year.

I had six pupæ sent to me from Devonshire; these I bred out, and have the imagines alive. Mr. T. Reuss has sent me eight living specimens, two of which met with an accident a few days after arrival, so this winter I have twelve specimens, and with these few I hope to be able to clear up a further point next spring, and that is, to find out whether the species pair in early spring. I have noticed no sign of autumnal pairing.

Bexley, Kent.

THE HUMBLE-BEES OF FORMOSA.

BY T. D. A. COCKERELL.

HAVING received from the British and Berlin Museums a large series of Formosan *Bombi*, I have thought it opportune to present an account of the species of that island, all of which appear to be endemic.

Bombus wilemani, n. sp.

Worker; length 15 mm.; black, the pubescence black, rust-red on abdominal segments 3 to 6, above and below; the small joints of

the tarsi also have reddish hair, and it is ferruginous on the inner sides of the middle and hind basitarsi, except the base of the former; head elongate, malar space longer than broad; eyes dark greenish; nodules of labrum low; fourth antennal joint very short, broader than long, not quite half length of third; ocelli small; tegulæ dark brown; wings pale reddish, the apical margin not conspicuously darker; nervures relatively slender, ferruginous; second and third abdominal segments with a few pale hairs in the middle.

Female; length 21 mm., width of abdomen 8; otherwise similar to the worker.

Hab. Formosa (A. E. Wileman). British Museum. This species is closely related, both in structure and colour, to *B. pomorum* of Europe. It is also related to the Formosan *B. bicoloratus*, but is smaller, with much more delicate venation. The similar-looking Japanese *B. andreae*, Friese, is related to *B. pratorum*, and therefore structurally distinct from *B. wilemani*. I have taken the worker, *B. wilemani*, as the type, since the female is in bad condition. Both specimens bear a written label, "Arizan, ix. 11, 1906, 7500 feet," and a printed one, "Tainan, Anping, S. Formosa."

Bombus bicoloratus, Smith, 1879.

From the Berlin Museum I have two females, four hermaphrodites, collected by Sauter in Formosa. Two of the workers are labelled "Kanshirei, 8. 6. 08."

Bombus bicoloratus var. *fulvolateralis*, n. var.

Worker; meospleura with the hair pale brown instead of black. Three collected by Sauter in Formosa; two are from "Kanshirei, 8. 6. 08." Berlin Museum.

Bombus latissimus, Friese, 1910.

This very fine species has only lately been described. A female from the British Museum was collected by Wileman at the same place as the types of *B. wilemani*, but on September 27th. From the Berlin Museum come one female and eleven workers collected by Sauter. One of the workers has red hair on each side of the first abdominal segment posteriorly. Only one Sauterian specimen has the exact locality specified; a worker from Chip Chip, S. Formosa, February, 1909. At first sight it might seem that *latissimus* was only a variety of *B. bicoloratus*, but it is certainly a distinct species, differing in its broader abdomen, the abundant red hair of legs, the apical dark band of anterior wings with its inner margin fairly straight (in *bicoloratus* it is conspicuously undulated or lobed), and in having the fourth antennal joint much longer than broad (in *bicoloratus* the fourth joint is short, hardly or not longer than broad).

A female of the Japanese *Megachile docderleinii*, Friese, was taken by Mr. Wileman in Formosa, and bears the label,

"Kozensho, Ko-tan-kgan, 6000 ft., ix. 7, 1096." It is about 21 mm. long—distinctly smaller than a Japanese example in my collection. I suspect that this species has been introduced into Formosa, as it is wholly absent from the large collection made by Sauter. There is in the Sauter collection a related species with much shorter mandibles.

CHESHIRE AND SOUTH LANCASHIRE ODONATA.

BY W. J. LUCAS, B.A., F.E.S.

RECENTLY I have seen a collection of dragonflies from Warrington, some belonging to the Municipal Museum, the remainder from Mr. G. A. Dunlop's collection. I record such of the local ones as bear date and locality labels.

Leucorrhinia dubia. Abbot's Moss, Cheshire: July 4th, 1908; July 2nd, 1909; August 1st, 1910.

Sympetrum flaveolum. A male, Flaxmere: August 5th, 1907.

Sympetrum scoticum. Flaxmere, Cheshire: August 5th, 1907; August 3rd, 1908. Abbot's Moss: July 4th, 1908; August 1st, 1910.

Calopteryx virgo. Amongst a number of *C. virgo* and *C. splendens*, usually without labels, is a specimen of the former species, which appears to be var. *anceps*. Whether this is a North Country specimen I cannot say.

Lestes sponsa. Abbot's Moss: July 4th, 1908; August 1st, 1910.

Pyrhosoma nymphula. Frodsham, Cheshire: June 9th–10th, 1902; July 18th, 1908; June 22nd, 1910.

Ischnura elegans. Flaxmere: August 5th, 1907. Padgate, South Lancashire: June 16th, 1909. A specimen bred out in the Museum; May 18th, 1909.

Agrion pulchellum. Frodsham: June 9th–10th, 1902.

Agrion puella. Frodsham: June 10th, 1902. Grappenhall, Cheshire: June 23rd, 1906. Padgate: June 16th, 1909.

Enallagma cyathigerum. Abbot's Moss: July 4th, 1908.

Perhaps the most interesting specimen is *S. flaveolum*, but being a male it is most probably a migrant. Mr. Dunlop will no doubt be able to satisfy himself as to whether it breeds in the Delamere Forest District or not. In the collection are two specimens of *Agrion pulchellum*, labelled "New Forest, 9 July, 1895." This species has not, I believe, been recorded for the New Forest, and the record would have been of interest; but, unfortunately, the specimens were bought at Stevens', and nothing further is known about them. Mr. Dunlop tells me in addition that *Æschna grandis* and *Æ. cyanea* occur very commonly in the district, even flying about the streets of Warrington, and that *Agrion puella* is common on the Old Quay Canal, Acton Grange, Cheshire.

Kingston-on-Thames: February, 1911.

HATCHING OF THE EGGS OF *ARGYNNIS LAODICE*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

IN the 'Entomologist' for March, 1909, I published an account of the life-history of *Argynnis laodice*, wherein I stated that the larvæ remain developed within the egg throughout the winter and emerge therefrom in the early spring. This statement M. Gillmer contradicts in his review ('Societas Entomologica,' xxiv. nos. 4-5) of the life-history, maintaining that the larvæ in a state of nature emerge from the eggs in the autumn. Subsequently I pointed out in the 'Entomologist,' October, 1909, p. 258, that I felt convinced M. Gillmer was wrong in his assertion, and that if any eggs emerged in the autumn this was due to the fact that the eggs in question were kept more or less under artificial conditions.

The Hon. N. Charles Rothschild, to whom I am indebted for the original eggs, now kindly tells me that he has received more than one hundred eggs of *A. laodice* during January of this year, from M. Kieselbach (living in Königsberg, where this butterfly is common), who has informed him that, out of a number of eggs deposited by a single female *laodice*, some hatched in the autumn, while others passed through the winter in the egg state, the young larvæ only making their egress from the shell in the spring. He further states that, in his opinion, the larvæ that emerge in the autumn are induced to adopt that course when kept under artificial conditions, although exposed to the cold; he also seems more or less convinced that in a state of nature the larvæ do not emerge from the eggs until the spring.

By this statement M. Kieselbach's opinion exactly coincides with my own.

It may be noted that *A. laodice* very closely resembles *A. paphia* in all stages of the larva, and the pupæ of both are so similar that they are almost indistinguishable. But the eggs of the two species differ: that of *laodice* bears a close resemblance to the egg of *A. adippe* in form and general structure, as well as the period of hatching. The latter are laid during July and August, and hatch about the beginning of the following April, while the eggs of *A. paphia* remain only about fifteen days in the egg state, hatching during August, when the young larvæ immediately enter into hibernation, without feeding on anything more than that portion of the eggshell which they eat away to allow of their emergence; they simply rest near the empty shell until the following spring, usually awakening at the end of March or early in April.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. DISTANT.

Fam. PENTATOMIDÆ.

Elasmucha tauriformis, sp. n.

Olivaceous-brown, the corium more olivaceous, the membrane pale olivaceous-brown; head sparsely coarsely punctate, the lateral margins sinuate, the lobes subequal in length, the central lobe almost impunctate; antennæ piceous, basal joint not reaching apex of head, second and third subequal in length, each much longer than first, remaining joints mutilated in type; pronotum rather sparingly but very coarsely punctate, the punctures somewhat confluent near anterior margin, the lateral angles longly, robustly, transversely produced, their apices finely, acutely narrowed, the posterior angles distinctly, rather broadly posteriorly produced; scutellum sparingly, coarsely punctured; corium very obscurely finely punctate; membrane not passing the abdominal apex; head beneath and sternum olivaceous-brown, sparingly, coarsely punctate, mesosternal process not reaching the anterior margin of the prosternum and backwardly produced between the intermediate coxæ; abdomen beneath greenish-olivaceous, abdominal spine almost reaching the intermediate coxæ, an obscure central longitudinal ridge, angles of the posterior segment broadly subprominent, rostrum about reaching the posterior coxæ. Long. $9\frac{1}{2}$ mill. Exp. pronot. angl. 8 millim.

Hab. Punjab; Murree.

The longly and apically spinously produced lateral angles of the pronotum is a distinctive feature of this species.

Elasmucha montandoni, sp. n.

Ochraceous, coarsely darkly punctate; produced pronotal angles carmine-red; scutellum with a large basal central oblong black spot; head coarsely punctate, the lateral margins almost impunctate; antennæ mutilated in typical specimen; pronotum coarsely punctate, the punctures somewhat confluent near anterior margin, lateral margins almost impunctate, a few punctures in linear series on their anterior areas, the lateral angles produced and apically recurved, their apices shortly subacute, posterior angles distinctly but shortly and obtusely backwardly produced; scutellum sparingly punctate, more thickly so on lateral margins, about apical fourth distinctly narrowed; corium coarsely punctate; membrane slightly passing the abdominal apex; body beneath ochraceous; prosternum more or less coarsely darkly punctate; mesosternal process not reaching the anterior margin of the prosternum; abdomen with a transverse reddish-brown streak on each side of the fourth and fifth segments, two pale levigate ochraceous streaks on each side of the sixth segment, spiracles piceous; posterior angles of the anal segment in female moderately produced, curved, and carmine-red; abdominal spine scarcely passing the posterior coxæ; rostrum shortly passing the posterior coxæ. Long. 7 millim. Exp. pronot. angl. $4\frac{1}{2}$ millim.

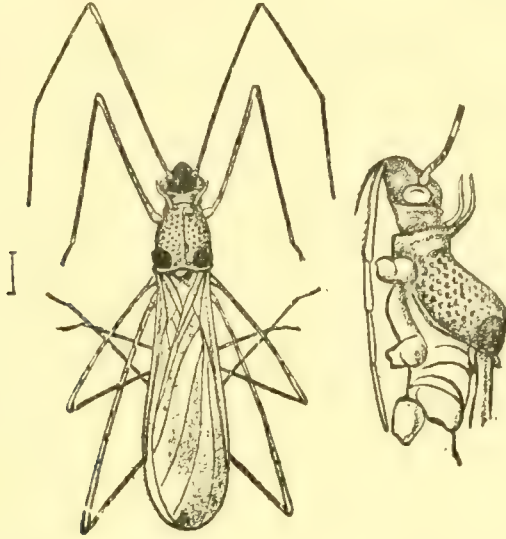
Hab. Bengal; Kurseong.

Dr. Montandon sent me a single specimen of this beautiful species.

Fam. BERYTIDÆ.

Metacanthus bihamatus, Dist., Ann. Soc. Ent. Belg. liii.
p. 360 (1909).

Hab. Ceylon.



METACANTHUS BIHAMATUS.

I take the present opportunity to figure this species. By the long hooked spines to the pronotum it is somewhat aberrant to the genus.

Gen. TAPROBANUS (*ante*, p. 24).

Although carefully shown in the sectional figure of the typical species (*ante*, p. 25), the generic diagnosis did not refer to the character of a *curved, upwardly directed, slender process on each side of the sternum between the intermediate and posterior coxæ*.

Fam. LYGÆIDÆ.

Macropes rufipes, sp. n.

Head, pronotum, and scutellum black; corium ochraceous, more or less streaked with piceous; membrane very pale ochraceous with the veins darker; body beneath black, the legs reddish-ochraceous; antennæ black, the first, second, and third joints more or less ochraceous, the apices of the second and third joints distinctly clavate and black at apices; pronotum broadly distinctly transversely impressed a little before base, before this a little convex and irregularly impressed, the lateral margins moderately rounded, the basal margin moderately concave, the whole very finely punctate; membrane extending to a little beyond the middle of the abdomen; connexivum dull ochraceous; abdomen above black, finely ochraceously pilose; body beneath black, very finely ochraceously pilose. Long. 7 to 8 millim.

Hab. Bengal ; Kurseong.

Allied to *M. punctatus*, Walk., but differing by the pronotum being less deeply concave at posterior margin ; the second and third joints of antennæ distinctly clavate at apices ; different colour of the legs, &c.

I am again indebted to Dr. Montandon for specimens of this species.

Fam. HENICOCEPHALIDÆ.

Henicocephalus limbatipennis, sp. n.

Head, anterior lobe of pronotum, scutellum, body beneath, and legs ochraceous ; antennæ, and middle and posterior lobes of pronotum, castaneous ; abdomen beneath with transverse fuscous markings ; hemelytra pitchy-brown, a basal angulate spot ochraceous, the lateral and apical margins broadly sordidly stramineous ; antennæ distinctly pilose, second joint distinctly longer than the third ; anterior lobe of head considerably longer than posterior lobe, elongate, margins subparallel, posterior lobe globose, the ocelli near its anterior margins ; posterior lobe of pronotum distinctly wider than middle lobe, its lateral margins roundly oblique, middle lobe centrally longitudinally sulcate. Long. 8 millim.

Hab. Ceylon ; Peradeniya (F. H. Gravely, Ind. Mus.).

Mr. Gravely found this species "running about on the ground in the jungle."

Allied to *H. majusculus*, Dist., but a smaller species, differently coloured, the pale lateral margin to the hemelytra broader and regularly continued to the apex, basal joint of antennæ shorter and more incrassate, middle lobe of pronotum with the lateral margins rounded, not obliquely narrowed anteriorly, &c.

Fam. REDUVIIDÆ.

Acanthaspis chilawensis, sp. n.

Black ; antenniferous tubercles, spines at base of pronotum, basal angles and a large spot behind middle of corium, and lateral marginal spots to abdomen above and beneath, ochraceous ; legs pitchy-brown ; first joint of antennæ about as long as head ; anterior lobe of pronotum sculptured, the anterior angles subprominent, posterior lobe closely rugose, lateral spines somewhat long, a little directed backward, their apices black, the two central basal spines much shorter, posteriorly directed ; scutellum with a long spine obliquely directed backward ; legs finely setose ; rostrum reaching the anterior coxæ, first and second joints subequal in length. Long. 16 to 20 millim.

Hab. Ceylon ; Chilaw (E. E. Green).

Closely allied to *A. quinquespinosa*, Fabr., but basal central spines to pronotum smaller, their basal areas black, not ochraceous, spot to corium larger, less transverse, and more oblong, &c.

Genus AMULIUS.

Amulius viscus, sp. n.

Head and antennæ black, the latter with the base of third joint (rather broadly) and base of fourth joint (narrowly) ochraceous; pronotum pale sanguineous, the anterior angles, some central suffusions to anterior lobe and the posterior lobe—excluding lateral areas—black; scutellum and corium black, apex of the former and a spot on apical area of the latter, ochraceous; membrane shining bluish-black; connexivum black with large pale sanguineous spots, a central longitudinal fascia to head beneath, ochraceous; sternum pale sanguineous, disks of meso- and metasterna and lateral areas of the latter, black; four spots near anterior margin of mesosternum ochraceous; abdomen beneath dull ochraceous, connexivum as above and a series of large sublateral spots black; legs ochraceous or pale sanguineous, a broad central annulation and apex to anterior tibiæ, apical areas of intermediate and posterior femora, the intermediate and posterior tibiæ and all the tarsi, black; rostrum black, about or almost reaching base of head; antennæ with the first joint less than half the length of head, second nearly as long as pronotum, third longer than fourth; anterior angles of pronotum long, spinously produced, the spines forwardly produced, curved, and slightly longer than first joint of antennæ, basal pronotal margin posteriorly laminately produced and strongly centrally emarginate; apex of scutellum somewhat tuberculous. Long. 19 millim.

Hab. Ceylon; Ratnapura (E. E. Green).

Allied to the Malayan *A. quadripunctatus*, Stål, but the anterior spinous pronotal angles black, much more slender, acute, and curved, &c.

“In life—has the anterior tarsi covered with a viscid secretion resembling Canada balsam. In living examples the red areas are quite brilliant” (E. E. Green *in litt.*).

Fam. NOTONECTIDÆ.

Anisops ali, sp. n.

Ochraceous, the hemelytra more or less shaded with fuliginous; eyes black; interocular space narrow, margins parallel, not or very slightly narrowing at base, above with a distinct central longitudinal impression, the margins of which are ridged, beneath narrow, parallel, of the same breadth throughout; pronotum with a distinct waved carinate line on the anterior area, commencing on the lateral margins behind eyes and then roundly directed upward and united between the inner posterior angles of the eyes; abdomen beneath fuscous. This species is allied in general coloration to *A. sardea*, Herr.-Schaff., and *A. fieberi*, Kirk. From both of these, however, it is distinctly separated by the narrow parallel interocular space, and by the distinct carinate waved line to the pronotum. Long. 5 to 6½ millim.

Hab. Ceylon; Diyatalawa (E. E. Green).

NOTES BY THE WAY.

THE restriction of the terms "type" and "co-type" to definite limits is an exceedingly simple matter, if we could but agree as to the limits. A world-wide authority in his particular order startled me to-day by stating that "co-type" could be applied to any specimen pronounced by the original describer to be co-specific with the type—that, in fact, you sent him a specimen, captured years after the description was published, he compared it with the type, returned it to you as co-specific, and you became, in consequence, the happy possessor of a "co-type"! Even "type" has a vague meaning for some authors. Two "types," both so labelled similarly by the author, were sold to a museum; one was from Ceylon, and the other from Kuching; his description gave "Kuching" as the only original locality—the sale of the Ceylon specimen as a type was, to say the least, irregular. "Co-types" are all the specimens of a single species immediately before the author when he draws up his description. The "type" is a single specimen selected at will by the author as most typical of this whole series of individuals.

A nice point of synonymy was raised recently, for which we have no recollection of provision by the British Association or Zoological Congress:—If an author publish a specific name already figuring in the same genus, and a second man subsequently publish a description of the same species and make for it a new and valid genus, does the first name, which is not truly co-specific with the other species as placed, take priority in the second author's new genus?

In our last we mentioned Irish entomological research; but a much more elaborate exploration has been going on respecting the insects of that very interesting group of islands off Madagascar known as the Seychelles. Prof. Stanley Gardiner, well known for his investigations in the Maldivé and Laccadive Islands, will shortly publish a detailed description of them, but we have already arrived at the third volume of the general account of the fauna collected there during 1908 and 1909 by Mr. Hugh Scott, the Curator at Cambridge. This is given through the medium of the Trans. Linn. Soc. of last November, and graphically introduces us to the sterile granitic rocks, rising in places to an altitude of two to three thousand feet. It is a most fascinating locality, since "there are well-marked distinctions between the entomological faunas of different parts," many species are obviously introduced, and there is a distinct Oriental element; forests at an elevation of some thousand feet were found most productive of truly indigenous species.

C. M.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Continued from p. 62.)

Mithuna arizana, sp. n.

♂. Antennæ fasciculate; head and thorax pale brown, abdomen paler. Fore wings pale brown, darker freckled; medial line dark brown, slightly oblique, interrupted above the middle; submarginal line dark brown, rather broad, much interrupted. Hind wings fuscous, outer margin and fringes yellowish.

♀. Similar to the male, but the medial line of fore wings is entire; hind wings paler than those of the male.

Expanse, 24 millim.

Collection number, 694.

One example of each sex from Arizan (7500 ft.). The male captured in September, 1906, and the female in August, 1908.

ab. parva, nov.

Smaller, the medial line of fore wings only distinct on the costa and the inner margin; the submarginal line less distinct and nearer the outer margin.

Expanse, 18–19 millim.

Two male specimens from Kanshirei (1000 ft.), June 13th, 1906.

Possibly these insects may be local forms of *M. quadriplaga*, Moore.

Ilema tricolor, sp. n.

Fore wings pale cinnamon-brown on basal two-thirds, blackish on outer third. Hind wings creamy white, a blackish border on the outer margin; the latter is broadest towards costa, slightly indented below middle, and narrowed at anal angle. Under side as above, but the basal two-thirds of fore wings creamy white, and the costal margins of all the wings streaked with yellow.

Expanse, 28 millim.

Collection number, 542 a.

One male specimen from Rantaizan (7500 ft.), May 13, 1909.

Siccia taiwana, sp. n.

Head and thorax white, faintly tinged with brown. Fore wings white, powdered with pale brownish chiefly on costal area; a black point near base of costa and a black mark below it; three blackish spots on the costa, from the first are traces of an antemedial line, and from the third a curved series of dusky dots (the second from inner margin bar-like) represent a postmedial line; a blackish spot at end of cell, and a dot about middle of cell; submarginal line dusky, slender, with blackish dots upon it; a blackish dot on the whitish fringes at apex, and a similar one about middle. Hind wings pale fuscous. Under side whitish; fore wings clouded with fuscous; hind wings with blackish discoidal dot and a dusky band beyond.

Expanse, 22 millim.

Collection number, 678.

One male specimen from Kanshirei (1000 ft.), August 19, 1905.

Nudaria (?) *semilutea*, sp. n.

Fore wings white; basal area, except extreme base, orange-yellow, limited by a partly curved line of the ground colour; the outer area clouded with dark brown. Hind wings whitish, faintly tinged with yellow; a dark cloud on outer margin towards the costa.

Expanse, 16 millim.

Collection number, 699.

One male specimen from Kanshirei (1000 ft.), June, 1906.

Chamaita hirta, sp. n.

♂. White, semi-transparent, the veins of fore wings clothed with brownish hairs, except on outer third (perhaps denuded).

♀. Whitish, semi-transparent, obscurely mottled with brownish (? stain).

Expanse, ♂ 18 millim., ♀ 18-20 millim.

Collection number, 681.

One example of each sex from Kanshirei (1000 ft.), May, 1906, and a female specimen, from the same locality, taken in August of that year.

Near *C. nympa*, Moore.

Hyposiccia dentata, sp. n.

Head and thorax dark brown, abdomen paler. Fore wings whitish, suffused with pale brown; basal third dark brown, hardly separate from a dark brown, dentate, antemedial line; medial and postmedial lines dark brown, dentate, space enclosed by the lines suffused with the darker colour; a black curved spot at end of cell, where the medial line is bent outwards, and a dot in the cell; submarginal line dark brown, interrupted, broadest towards costa; fringes whitish, preceded by a series of dark brown dots. Hind wings fuscous, fringes paler. Under side fuscous, costal and outer margins of fore wings and fringes of all wings paler.

Expanse, 18 millim.

Collection number, 698.

One male specimen from Tainan (on the plains), May 14, 1906.

Near *H. mesozonata*, Hampson.

Asura limbata, sp. n.

♂. Antennæ whitish above, reddish beneath; head and thorax white, the latter marked with brownish. Fore wings brownish, a black dot at end of cell, from which a black streak runs towards base of the wing; a subbasal line runs to a white streak on the inner margin, thence turns upward, forming a white hook-like mark; outer margin with white border, enclosing three brownish spots on the upper portion. Hind wings paler, with an interrupted white border on the outer margin.

♀. Paler, but this is probably due to its worn condition.

Expanse, ♂ 22 millim., ♀ 24 millim.

Collection number, 695a.

One specimen of each sex from Kanshirei (1000 ft.). The male captured in April, 1907, and the female in May, 1908.

Asura pica, sp. n.

♀. Fore wings blackish with a white hook-like mark as in *limbata*, but the streak is more oblique to inner margin, and is twice interrupted near the costa; the white outer border of *limbata* is here represented by four white spots—one on the costa before apex, one at apex, one at middle, and one at the inner angle; all four united by a slender, wavy, submarginal white line. Hind wings blackish.

Expanse, 18 millim.

Collection number, 695.

One female specimen from Kanshirei (1000 ft.), September 22nd, 1906.

May be a seasonal form of *A. limbata*.

NOTES AND OBSERVATIONS.

HYDRILLA PALUSTRIS, &c., AT WICKEN.—Though it is, perhaps, rather late in the day to tell of last summer's captures, it may be well to record that I was fortunate enough during a visit to Wicken in June to take two male specimens of *Hydrilla palustris*. I believe four other specimens were taken about the same time by other collectors. Considering the amount of wind, oftentimes from the east, we had during our stay of nearly three weeks, my friend (the Rev. J. W. Metcalfe, of Ottery St. Mary) and I did fairly well. *Arsilache albovenosa* was not much in evidence, but I had never on my two previous visits seen so many *Macrogaster castaneæ (arundinis)* on the sheet, or such abundance of *Meliana flammea*. Four hard days' work at Tuddenham produced only about two dozen *Acidalia rubiginata* between us; *Lithostege griseata* was almost over, but *Agrophila trabealis* was plentiful. In exploring for *L. griseata* we came upon a fresh locality for *A. trabealis* which promised well, but the presence of an irate farmer who would not listen to reason made future visits undesirable. The pine trees at Tuddenham are well-known as the resting place of *Hecatera serena*, but our experience was that the trees were quite deserted for the flowers of the viper's bugloss (*Echium vulgare*) which was growing in great profusion on the hillside. I took an entirely new series from the flowers, the moths settling quietly in brilliant sunshine. The Rev. J. W. Metcalfe was fortunate enough to take a specimen of *Dianthæcia irregularis* in the same way. The weather was fine during the whole of our stay except for one night when a thunderstorm was imminent, so much so as to drive us home in haste, only to find that it had left Wicken practically untouched in its course, and to have the mortification of knowing the next morning that the previous night had been entomologically the night of the season. The continuance of wind, however, was a serious disadvantage.—Rev. J. E. TARBAT; Fareham, Hants.

UNUSUAL EMERGENCE OF *NOCTUA PLECTA*.—On February 7th I found a perfectly fine specimen of *Noctua plecta* in the vestry of the church. The larva had probably pupated in the vestry in the autumn, and the warmth of the church had caused the imago to emerge at this early date.—Rev. J. E. TARBAT; Fareham, Hants.

UNRECORDED OCCURRENCES OF *EUVANESSA ANTIOPA*.—Possibly some light is thrown upon the question of the identity of the larvæ referred to as those of the Camberwell Beauty, in the quotation under the above heading, given by Mr. Rowland-Brown (*antea*, p. 68), by the following note which occurs in Humphreys and Westwood's 'British Moths,' vol. i. p. 91, where it is stated of the larva of *Porthesia chrysorrhæa*, L.:—"It feeds on various plants, especially whitethorn, in June, and has at times become so remarkably abundant as to cause a serious panic to Londoners, especially in 1782, when prayers were offered up in the churches against the enemy; and the churchwardens and overseers of the neighbouring villages, after offering rewards for collecting these caterpillars, attended to see them burnt by bushels." It will be noted that both the date and the measure by which the quantity of the caterpillars was estimated are the same in the two accounts, and I think we should not be far wrong in assuming that Professor Hall Griffin's Camberwell Beauty caterpillars were none other than those of *Porthesia chrysorrhæa*.—ROBERT ADKIN; Lewisham, Feb. 1911.

WITH regard to Mr. Rowland-Brown's interesting reference in your last number to the abundance of larvæ in Camberwell, in 1782, I think there is little doubt but that they were *Stilpnotia salicis*, for I have met with them abroad—practically in thousands. Yet another species must be taken into consideration, viz. *Malacosoma neustria*, the larvæ of which many years ago (I am speaking of the fifties and early sixties) occurred in the greatest abundance. Trees in orchards, I can remember, were often denuded of their leaves, such were their ravages. My earliest recollections in entomology are associated with collecting the "rings" of ova of this species. With regard to *Vanessa antiopa*, in my experience the larvæ are essentially fallow feeders. I have found them in Spain and commonly in the South of France but always on fallow. It is true the imagines frequent willows, but is it not the *Cossus* and other exudations which attract them?—A. H. JONES; February 4th, 1911.

AUTUMNAL EMERGENCE OF *POLYGONIA C-ALBUM*, var. *HUTCHINSONI*.—During Sept. 1910, I sent the Rev. Alfred Stiff, of Leigh-on-Sea, some two dozen larvæ of *c-album* which I had bred from Wye Valley stock. During January of this year he wrote to me and said he had been most successful with them, and had bred four specimens of the var. *hutchinsoni*, which emerged mid-October. This seemed to me very strange, as none of the remainder of the brood in my hands had produced the variety, and I had never had, nor heard of the variety being bred in the autumn, it being purely a June or early July form. I had bred some of the new straw-coloured variety, unheard-of before this year, and rather expected that he had mistaken these for var. *hutchinsoni*. I therefore asked him to let me see the specimens, and

greatly to my surprise found they were very fine and large var. *hutchinsoni*.—L. W. NEWMAN; Bexley, Kent.

LATE AUTUMN AND WINTER EMERGENCE OF *EMATURGA ATOMARIA*.—During 1910 I reared a considerable number of *E. atomaria* from ova from Lancs. parents; the larvæ fed up rapidly and pupated in June. During July I turned out my breeding pots, collected the pupæ and stored them away in glass-top metal boxes, in as cold a place as possible for the winter. I did not again look at the pupæ till September, when I was rather surprised to find six specimens had emerged, two being dead and the other four alive. I noticed several dozens were forming up, so these were removed to a breeding cage, and the imagines duly emerged. As others continued to form up, they also were removed from their cold place and kept warm. Moths continued to emerge right up to the beginning of January, when they stopped. In all, over twenty-five per cent. of the pupæ emerged from September to January, a few almost every day.—L. W. NEWMAN; Bexley, Kent.

PHASGONURA VIRIDISSIMA (ORTHOPTERA).—Mr. B. S. Williams sends me a fine female specimen of this grasshopper, that Surrey may no longer bear the reproach of having no certain record of this fine species. It was taken by himself at Pickett's Hole, Rannmore, August 13th, 1910.—W. J. LUCAS.

HEMEROBIUS STIGMA (NEUROPTERA).—On January 29th last, a specimen of this brown lacewing was obtained by beating a young Scotch fir at the Black Pond, Esher Common, Surrey. I have found the species previously in this locality in mid-winter; but still the capture may be worth recording.—W. J. LUCAS.

TRIPHENA PRONUBA IN JANUARY.—This evening (Jan. 27th) I took a *T. pronuba* flying around a lamp in a room. The specimen seemed to me to be too fresh for one of the partial second brood of September, 1910. Last October I found several larvæ of this species, in the garden here, nearly full-grown and still feeding. Is this a common occurrence?—LAURENCE JONES; The Rectory, Marks Tey.

NOTES ON *CHILOSIA GROSSA*, *CORDYCEPS*, AND *SMERINTHUS TILIE*.—Reading the note on *Chilosia grossa* by Lt.-Col. Nurse ('Entomologist,' vol. xliii., p. 313) reminds me that, under the same circumstances, I used to come across pink larvæ about one-third of an inch long. If I remember rightly, there were several in one stem. I am afraid I did not trouble much about rearing them—probably I may be told they were some commoner well-known insect. This was when I was living near Plymouth. The illustration of *Cordyceps militaris* (l.c. p. 297) recalls the gruesome appearance of a large *C. ligniperda* larva I left in a cylindrical tin and neglected. As well as I can remember, the fungus was nearly an inch long and growing vertically from the whole length of the back. The damp atmosphere of the tin had evidently suited the fungus better than its host. Mr. Arkle's note (l.c. p. 294) that *S. tilie* is very rare in the Chester district is equally true of the Plymouth one, where I could never succeed in finding the species, though I used to dig up the pupæ fairly freely

around elms about Oxford. Around Plymouth *Sphinx ligustri* seemed to be the commonest "hawk moth." A catalogue giving the distribution of the various "hawk moths" in the several counties would be highly interesting.—(Rev.) FRED. JULIAN BRIGGS; Codrington College, Barbadoes, November 26th, 1910.

NOTES ON THE LIFE-HISTORY OF *ANTITROPA ERINNYS*.—The eggs are greyish white in colour, and are laid in great numbers on both sides of the leaves of a lily (*Dracæna hookeriana*) that grows wild in the woods and elsewhere. The leaves of this plant are about two to two and a half inches in width, and very thick; consequently the young larva when it emerges must be very strong, for as soon as it is hatched it at once eats a small portion of the leaf at the edge, and then turns down the same completely over itself, joining it firmly together with white silky thread. It is then light green in colour, with a black head. It comes out of its house to eat, and after about five days it closes up each end of the same and remains therein for about two and a half to three days whilst it changes its skin; it is then green in colour, with a yellow head with six false eyes on the same, black in colour. After moulting, the larva frequently occupies the old house, if large enough; if not, it makes another, going through the same operation as before, but turning over a larger portion of the leaf. After about eight days it again changes its skin; it is then much paler green, head yellow with a brown line down the centre, which widens at the mouth; the six false eyes which are black are placed two on each side of the brown line on the front of the head and one on each side of the same. The larva now measures about three-quarters of an inch in length and eats freely, but returns very quickly to its house, always backwards, if disturbed whilst feeding. Seven days later it again changes its skin, and remains in the following state until it pupates (as the last two stages are practically identical in colour and markings): the body very nearly white and very transparent; there is a black line between the second and third segments, and between the eighth and ninth segments; on the back there is a light yellow round spot, and on the last segment above the hind claspers there is a hard yellow patch very similar to the brown one in *Plötzia fiara*. Head large and yellow in colour, with the brown marking more distinct and forming a triangle above the mouth; the six false eyes black in colour and much larger. When full grown it is a little over two inches in length. I may mention that it always comes out of its house to drop its frass. When about to pupate, which it does sometimes in its last house, it completely covers in each end of the same—the part whence the perfect insect emerges with white silk, while the old cast skin fills up the other end. Sometimes it pupates on the under side of the leaf, and then it spins a lot of white silk on that portion of the leaf and fixes itself with a band across the centre of the body. It changes in about three to four days to a very fine pupa, which is pale bluish-white in colour and has the end of the abdomen very pointed; there is a straight black line down the middle of the thorax; the six false eyes are replaced by black spots on the pupa; the case enclosing the trunk, which is only fixed to the pupa as far as the end of the wing cases,

is very long, extending about a quarter of an inch below the end of the pupa. It remains about twenty-one to twenty-eight days in this state. There is no doubt this species is very badly attacked by ichneumons, and also by dipterous flies, in all its stages, including the ovum. It is also eaten, whenever caught outside its house, by ants, mantis, cockroaches, &c., more particularly in the first two stages. The butterfly is fairly common, and has been fully described by Mr. Roland Trimen.—GEO. F. LEIGH, F.E.S.; Durban, Natal, September 27th, 1910.

ERRATA.—P. 75, line 1, for *brumata* read *boreata*; p. 75, line 8, for *back* read *bark*.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 1st, 1911.*—Mr. G. T. Bethune-Baker, F.Z.S., in the chair.—It was announced that the Council had nominated the Rev. F. D. Morice, M.A., as President for the current year.—Mr. W. J. Kaye exhibited several *Heliconii* from Eastern Ecuador, including the forms *H. rubripicta*, *adonides*, and *feyeri* with streaked hind wings. He observed that it seemed now to be possible and even likely that *H. melpomene aglaope* would eventually be proved to be linked with *H. plesseni* through these newly discovered forms, and that this species would then have to be sunk as a subspecies of *H. melpomene*. Similarly, *H. notabilis* through *ilia* and *feyeri* was probably only a subspecies of *H. erato*, though the material was insufficient at present to form a conclusion.—Dr. Nicholson exhibited a new species of *Tachyporus* which he has named *fasciatus*. There were two specimens taken at Wicken Fen from under sedge refuse, the one in April, the other in August, 1910. This species is intermediate between *T. solutus*, Er., and *T. chrysomelinus*, L. It differs from the former in the shape of the antennæ, which are of the same length, but are not thickened towards the apex; by its finer puncturation throughout; by the pronounced broad black band on the elytra; and by the fact that the marginal bristles of the elytra are long and stout, as in *T. chrysomelinus*, and not short and fine, as in *T. solutus*.—Mr. H. J. Turner exhibited several very interesting forms of *Luperina guenéei*, including two new aberrations:—(i) ab. *murrayi* (n. ab.), which is quite typical *L. guenéei* in texture, shade of colour, and in markings, with this very marked difference, that the submarginal area between the dark marginal lunules and the submarginal line is much paler than any other portion of the wing, throwing out by contrast these dark lunules very conspicuously; (ii) ab. *fusca* (n. ab.), of which the three specimens exhibited are undoubted *L. guenéei* in all their characters but depth of colour. These are believed to be the first melanic specimens which have been so far obtained. All the markings are much intensified, the ground colour is much darker than in typical examples, very dark grey with, in a good light, faint flushes of a ferruginous tint. The contrast between ground colour and markings is very much stronger than in any of the other forms.—Mr. Champion exhibited on behalf of Mr. J. H. Keys the black variety of *Athous*

hemorrhoidalis, F., from Dartmoor, recorded by the latter in the Ent. Mo. Mag., xlv., p. 262; and also a red variety of the male of *Agabus bipustulatus*, L., from the same locality.—The Rev. A. T. Stiff, who was present as a visitor, exhibited some second-brood specimens of *Polygonia c-album* var. *hutchinsoni*. The vars. including three intermediates, emerged on October 16th, 19th (3), 20th, 21st (2), 22nd, 23rd and 26th, 1910. It is believed that there is no record of var. *hutchinsoni* having ever been bred in the 2nd brood of *c-album*.—Mr. Newman writes: "I have bred thousands of *c-album* of the second-brood in various years, and never one *hutchinsoni*, and I have never heard of any one else doing so."—Mr. Rowland-Brown and Mr. Bethune-Baker both observed that they had taken hibernated specimens of this form on the Continent.—Dr. O. M. Reuter communicated a paper entitled "Bryocorina nonnulla æthiopica descripta ab O. M. Reuter et B. Poppius."—Commander Walker, one of the Secretaries, read a paper on behalf of Col. Manders, entitled "A factor in the production of mutual resemblance in allied species of butterflies." The methods adopted in his experiments, and the conclusions drawn from them by the author, were to some extent the subject of criticism both by Mr. G. A. K. Marshall and Dr. Chapman.—Mr. Merrifield added a few observations with regard to the comparative immunity of Pierine butterflies from the attacks of birds.—A vote of condolence with the family of the late Mr. J. W. Tutt was moved from the chair, all the Fellows present signifying approval by rising.—GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 12th, 1911.*—Mr. W. J. Kaye, F.E.S., President, in the chair.—The President referred to the great loss that the science of entomology had incurred by the death of Mr. J. W. Tutt, a past President of the Society.—Mr. Phillips, of Forest Gate, was elected a member.—Mr. Tonge exhibited photographs of the ova in situ of *Plebeius argus* (ægon), *Ruralis betulae*, and *Calamia lutosa*, and also of the early stage of a wasp's nest (*Vespa sylvestris*) found in a pig-sty.—Mr. Lucas, a teratological example of *Anosia plexippus* with right fore wing shorter and narrower than normally and with concave outer margin.—Mr. Newman, (1) extremely light and very dark forms, with unusually small and very large forms, of *Malacosoma castrensis* and *M. neustria*; (2) a very red *Phlogophora meticulosa*; (3) second brood specimens of *Pericallia syringaria*, small and dark banded; (4) second brood of *Selenia lunaria*, i.e. var. *delunaria*; and (5) living imagines, pupæ and full-fed larvæ of *Aphantopus hyperanthus* reared by Mr. Oliver.—Mr. Adkin, selections of several broods reared originally from a black female ab. *nigra* of *Boarmia gemmaria*, and communicated a full note on the results.—Mrs. Hemming, bred and caught series of *Melitæa aurinia* from Wiltshire, where the species has been somewhat common.—Mr. Hemming, on behalf of Mr. P. A. Buxton, the same species with the note that all emerged in the afternoon; he also showed series of *Adopæa flava* from Sussex, showing two distinct forms.—Mr. Coote, two very dark green examples of *Panolis piniperda*.—Mr. Platt-Barrett, an example of *Saturnia pavonia-major* from Sicily.—Mr. Kaye, *Myelobius murana*, a sphingid-

like *Pyrale* from South America.—Mr. Step, specimens and a series of photographs of the growth and development of the *Myrogaster*, *Brefeldia maxima* found by him at Horsley, and a cluster of oak galls *Cynips kollari* from which birds had systematically extracted the tenant larvæ.—Dr. Hodgson, long series of varied forms of *M. aurinia* of many localities.—Mr. West called attention to the drawer of the Society's type collection which he was exhibiting, and to which, while rearranging, he had added some sixty species of Coleoptera from his own collection.—Mr. Priske showed a number of slides illustrative of the life-history of the glow-worm, which Mr. Main and he were observing, and read notes on what they had done so far.—Mr. Lucas read a paper: "Notes on the Natural Order Neuroptera," and showed a large number of lantern slides to illustrate his remarks.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting held at the Royal Institution, Colquhoun Street, Liverpool, December 19th, 1910, Mr. R. Newstead, M.Sc., F.E.S., Vice-President, in the chair.—The Reports of the Council and Hon. Treasurer were read and adopted, and the following members were elected as officers and Council for the ensuing year, *viz.*—President, S. J. Capper, F.E.S.; Vice-Presidents, W. J. Lucas, B.A.; C. E. Stott; Claude Morley, F.Z.S.; P. F. Tinne, M.A., M.B.; Geo. Arnold, M.Sc.; Treasurer, Dr. J. Cotton; Secretaries, H. R. Sweeting and Wm. Mansbridge; Librarian, F. N. Pierce; Council, E. J. B. Sopp, F.R.Met.S.; Wm. Webster, M.R.S.A.I.; Wm. Mallinson; W. T. Mellows; L. H. Lister; G. M. Taylor, M.A.; C. B. Williams; R. T. Cassal, M.R.C.S., L.S.A.; O. Whittaker; R. Wilding; and L. West, M.I.M.E. — Mr. Robert Newstead, the retiring Vice-President, delivered the Address, which was entitled "The Taxonomic Value of the Genital Armature in the Tsetse Flies (Genus *Glossina*)."
He stated that he had made a careful examination of all the hitherto described species of the genus *Glossina*, which had not only revealed some very striking morphological characters, but had led to the discovery of three hitherto undescribed species, *Glossina submorsitans*, Newst., *G. brevipalpis*, Newst., and *G. fuscipes*, Newst., and also to the re-establishment of Bigot's *G. grossa*. The scheme of classification adopted was based entirely upon the taxonomic characters of the male armature, which are the true and almost only natural anatomic elements that can at present be found in these insects. He had found that the species fell into three very striking and distinct groups, each being separated by very trenchant characters. These are, Group I. (the *fusca* group).—This division includes the four largest species of the genus: *G. fusca*, Walker; *G. grossa*, Bigot, which have a Western distribution; *G. longipennis*, Corti; and *G. brevipalpis*, Newst., occurring chiefly on the eastern side of the continent (Africa). In all of these species the claspers are quite free, there being no membrane stretching between them; the distal extremities of these appendages have either a single large and bluntly pointed tooth-like extension, or they are bluntly bidentate; the harpes in all cases being markedly different in their morphological characters. Group II. (the *palpalis* group).—To this division

belong the following species:—*G. palpalis*, Rob. Desv.; *G. tachinoides*, Westwood; *G. fuscipes*, Newst.; and *G. pallicera*, Bigot. In all of these species the claspers of the males are connected by a thin and finely spinose membrane, which is deeply divided medially, but in all cases the distal extremities of the claspers are quite free and widely separated. Group III. (the *morsitans* group).—This group comprises: *G. morsitans*, Westwood; *G. submorsitans*, Newst.; and *G. longipalpis*, Wiedemann. In these the claspers are completely united by a spinose membrane, and they are also fused medially. They are of very remarkable form, their shape somewhat resembling the scapula of a mammal in miniature, and are altogether much more highly complicated structures than those in either of the preceding groups. Thus we see in these three groups forms which are so widely different as to lead one to assume, without taking other external features into consideration, that they represent three distinct genera. Certain it is that these insects illustrate one fundamental principle of evolution, namely, that they have attained great development of one set of morphological characters and have retained others apparently of an ancestral type.

January 16th, 1911.—Mr. Geo. Arnold, M.Sc., Vice-President, in the chair.—A discussion on "*Agrotis cursoria* and its Varieties" was opened by Mr. Wm. Mansbridge, and continued by Mr. T. Baxter, of St. Anne's-on-Sea, Mr. F. N. Pierce, and other members.—Mr. Baxter brought his fine varied series of *cursoria* for exhibition, which included some very rare forms, as well as the commoner vars. *brunnea*, *ochrea*, *sagitta*, *cærulea*, *costa-cærulea*, and *obsoleta*. Mr. W. Mansbridge also brought a varied series from St. Anne's. At Wallasey and Crosby *cursoria* is of extremely rare occurrence and, though still common on the North Lancashire sandhills, it is not nearly so abundant as was the case some twenty years ago, owing to the encroachments made by builders and golfers upon its haunts. Mr. Baxter said that, having given particular attention to the matter, he had never seen the ordinary mottled form *in coitu* with the streaked form *sagitta*; he suggested that there might be two species in collections under the same name; he had seen many pairs in copulation during the last season, but they were always of similar varieties. Other exhibits were by Mr. C. B. Williams: *Hesperia lineola*, *Apamea ophiogramma*, and *Plusia moneta*, from Cambridge; a series of *Macrogaster castaneæ* and a large number of local fen species from Wicken.—Mr. Geo. Arnold brought *Pepsis formosus*, from California, locally called the "Tarantula Killer," together with our largest British Pompilid, *Salix fuscus*, for comparison; *Amomma burmeister*, male and female—the "Driver Ant"—from Central Africa.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalaenæ in the British Museum.
Vol. x. By Sir GEORGE F. HAMPSON, Bart. London: Printed
by Order of the Trustees. 1910.

In this volume of eight hundred and thirty pages the *Erastrinae*, a subfamily of the *Noctuidæ*, are catalogued and described. Of the

twelve hundred and twenty-two species comprised in the subfamily over one-fourth are novelties, whilst very nearly half of the one hundred and thirty-six genera to which the species are referred are new.

More than half of the *Erastrinae* are included in the following six genera:—*Eublemma*, Hübn. (t. *suava*, Hübn.), 230 species; *Ozarba*, Walk. (t. *punctigera*, Walk.), 107 species; *Tarache*, Hübn. (t. *cafraria*, Cram.), 102 species; *Lithacodia*, Hübn. (t. *bellicula*, Hübn.), 86 species; *Eustrotia*, Hübn. (t. *uncula*, Clerck), 73 species; *Cor-gatha*, Walk. (t. *zonalis*, Walk.), 53 species.

On the other hand, upwards of sixty genera have each only one species, and seventeen other genera have but two species assigned to each of them.

The British species of *Erastrinae* are:—5147. *Eublemma* (*Thalpo-chares*) *ostrina*, Hübn. 5181. *Eublemma* (*Thalpo-chares*) *parva*, Hübn. 5185. *Eublemma noctualis*, Hübn. (*Thalpo-chares*) *parva*, Hübn. 5807. *Lithacodia* (*Erastria*) *fasciana*, L. 5859. *Eustrotia* (*Hydrelia*) *uncula*, Clerck. 5862. *Eustrotia olivana*, Schiff. (*Bankia argentula*, Hübn.). 6000. *Erastria* (*Agrophila*) *trabealis*, Scop. 6185. *Tarache* (*Acontia*) *lucida*, Hüfn. (*solaris*, Schiff., *albicollis*, Fab.). Numbers show position in arrangement.

The present volume is the seventh of the series treating of the *Noctuidæ*. Of this extensive family of moths considerably over six thousand species have, so far, been dealt with. Not only are the species fully described, and the distribution, as indicated by specimens in the National Collection, set out, but all the new species, and also those not previously illustrated, are figured. The previous *Noctuid* volumes are—iv. *Agrotinæ* (1903); v. *Hadeninæ* (1905); vi. *Cucullianæ* (1906); vii.–ix. *Acronyctinæ* (1908–10).

It may be mentioned that the Atlas of Plates belonging to vol. x. will not be ready for a few months.

Annual Report of the New Jersey State Museum. Including a Report of the Insects of New Jersey. Pp. 880. Trenton, N. J. MacCrellish & Quigley. 1910.

THIS is a revised and extended edition of an exceedingly useful list. It comprises references to 10,385 species, as against 8537 in the second edition (1900), known to occur in the State of New Jersey. Besides numerous illustrations in the text, there is a map, in colour, and three portraits—Head of the Biological Department, State Entomologist, and State Taxidermist.

A Book of Nimble Beasts. By DOUGLAS ENGLISH. Pp. 319. London: Eveleigh Nash. 1910.

FOR boys and girls who wish to know something about the appearance and habits of some of our smaller mammals and common insects, this attractive little book should be an acceptable gift. The illustrations, over two hundred in number, are from photographs taken by the author. There are four coloured plates.

OBITUARY.

WE regret to announce the death of **GERALD GEORGE HODGSON**, who was born in Brighton on October 10th, 1860, and was educated at the College there, and at King's College, London. House Physician at King's College Hospital; House Surgeon at the Brighton and Hove Dispensary; and afterwards House Physician and House Surgeon at the Sussex County Hospital. Succeeding his father, he was in private practice for eight years in Brighton, and for the last eight years had been attached to the Royal Eye Hospital, Southwark.

A very busy and strenuous life left him but few opportunities of pursuing his favourite studies of botany and entomology, the latter for many years being most intermittent, but this dearth of opportunities caused him to note more particularly the habits of the creatures he met with, and he studied closely those little things that incline to the paucity or abundance of insect life, so frequently neglected by the mere collector. In 1898 his health broke down, after a severe illness brought on by overwork and a bicycle accident, and upon his partial recovery he was peremptorily ordered to give up his profession and go for a long sea voyage. This culminated in his settling for a time in Queensland, where he took up some land and regained health in its culture. As opportunity served, he again used his net and obtained many rare and interesting butterflies whilst in the colony.

Upon his return home, he took up his last medical appointment, and in his spare time arranged his cabinet of *Lycænidae* upon a plan of his own, namely, to exhibit at a glance over the drawer similar aberrations and varietal forms of each species. Thus the columns represented the species, and the cross-files the aberrations, either common to all or only to a few of the butterflies, placed together as a group.

Hodgson was a very hard worker in the field, and the toil he willingly underwent would deter many men, but with it all he was very successful, and his "luck" in obtaining varieties almost phenomenal. He was not a prolific writer, but his lectures and papers show much original work; as witness an address given to the City of London Society, 1909, opening an intended discussion upon the relative "Importance to the *Rhopalocera* of the upper or under sides of the wings." In this he dealt with the subject in such detail that he really covered the whole ground and left nothing debatable to be entered upon. He was also a keen botanist, and probably knew more of the life-histories of our British Orchids in the unflowering stages than any living man.

Dr. Hodgson's death was entirely unexpected. He left London, and was about to go to Devonshire for a short rest, but was found to have passed away in his sleep on Friday the 3rd ult.

In private life he was geniality personified, and much beloved by the young, entering into their sports and games with enthusiasm; whilst best of all, perhaps, was his rule of life, "If possible, let no day pass without doing some one an act of kindness." This shows what the real man was more than any adulatory epitaph.

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APRIL, 1911.

[No. 575

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

(Published by Permission of the Trustees of the British Museum.)

THE arrangement of the Coleoptera in the last edition of Reitter's 'Catalogue' of the European species is one which appeared to be quite new and strange to many of our students of the British fauna.

That arrangement seems, however, to have been based very largely upon the classification of the Coleoptera proposed by Ganglbauer in 1903, which itself is only one of three or four different classifications published since the appearance of Sharp's in the second volume on 'Insects' in the Cambridge Natural History.

The classification proposed by Dr. Sharp, in which the families of Coleoptera are grouped together in six series, beginning with one highly specialized group, the Lamellicornia, and ending with another as highly, or perhaps even more highly, specialized group, the Rhynchophora, was evidently not framed to accord with any particular views in regard to the phylogeny of the groups.

In this respect it differs from those more recent classifications, in which the aim has been to arrive at correct views as to the origin and different lines of descent of the various groups and families, and to give expression to those views in the classification.

As these attempts to classify the beetles in accordance with their phylogeny seem to be still not very generally known to British students, it is proposed here to give some account of them.

No serious attempt to establish a general classification of the Coleoptera, based upon phylogeny, seems to have been made until Professor Lameere undertook the task, whose first results were published in his "Notes pour la Classification des Coléoptères."* This paper, which received notice in the 'Entomologist' at the time, is remarkable, not so much for the novelty of the classification proposed as for the many valuable hints and suggestions it contained, and the great stimulus it appears to

* Ann. Soc. Ent. Belg. xliv. p. 355 (1900).

have given to others to work in the same field. Notwithstanding some serious mistakes which have since been very readily admitted by the author himself, Lameere's classification was a great step in the right direction. Previous to its publication, Ganglbauer had recognized that three different types of wing-venation are to be met with in the Coleoptera: one characteristic of the family-series Caraboidea; another of a series of families that used to be included in the heterogeneous assemblage known as the Clavicornia, but which he for the first time had withdrawn to form into a distinct group or family-series, the Staphylinioidea; and a third type, occurring under various modifications in the different families that did not come into either of those two family-series.

Accepting this threefold type of wing-venation as a basis for classification, Lameere divided the Coleoptera into three suborders: the Cantharidiformes, the Staphyliniformes, and the Carabiformes, the two latter corresponding almost wholly with the family-series Staphylinioidea and Caraboidea of Ganglbauer, but with a fresh arrangement of the families in each group. The Cantharidiformes he subdivided into ten groups, which from considerations of structure and phylogeny he placed in the following order: Teredilia, Malacodermata, Sternoxia, Macroductyla, Brachymera, Palpicornia, Clavicornia, Phytophaga (with which he includes the Longicornia and Rhynchophora, the Brentidæ excepted, which he places among the Clavicornia), Heteromera, and Lamellicornia. He pointed out the absurdity of Leconte and Horn's view that the Rhynchophora were distinct from all other Coleoptera, and the lowest and most ancestral of all; that, on the contrary, this group was very highly specialized, and so little distinct from the Phytophaga that they may reasonably be supposed to be derived directly from them and ought to be included in the same group.

At this time he believed that the Teredilia (in which group were included the families Lymexylonidæ, Anobiidæ, Bostrichidæ, Cupedidæ, and Derodontidæ) contained the forms most nearly approaching to the ancestral type of beetle; and he therefore placed the Cantharidiformes as the first of his three suborders. It was a mistake, as he has since recognized, not to place the Carabiformes first; and for this his first proposed classification, of which we have given here the bare outlines, he has in a later paper* substituted another.

In the meantime there had been two other very notable contributions to the morphology and classification of the Coleoptera, one from Professor Kolbe,† of Berlin, and the other from Herr

* "Nouvelles Notes pour la Classification des Coléoptères," in *Ann. Soc. Ent. Belg.* xlvii. p. 155 (1903).

† "Vergleichend-morphologische Untersuchungen an Koleopteren nebst Grundlachen zu einen System und zur Systematik derselben," in *Archiv. für Naturg.* 1901, Beiheft. p. 39.

Ganglbauer,* of Vienna. Each of these distinguished systematists has given us a classification of his own, based on views in regard to the phylogeny and relationship of the different groups and families. Ganglbauer, whose paper came last, was enabled to give a full account, accompanied by rather searching criticism, of the classifications of his two predecessors.

Professor Kolbe has since modified his views to some extent, as shown in a subsequent publication,† wherein he has revised his classification and entered more largely into the arguments in its favour.

The three classifications, that of Ganglbauer and the later ones of Lameere and Kolbe, differ from each other in certain important respects, which is not strange considering the great difficulties the subject presents; but they have also some very important points of agreement, and this may be considered a great gain to the systematics of the Coleoptera.

The differences are due largely to the relative value assigned by each to the principal characters taken into consideration; and as some of these characters had not been used before to any great extent in the classification of the Coleoptera, it may be well, first, to point out what they are, and to call attention to the different interpretations that have been or may be placed upon them.

Wing-venation.—Although it was not until quite recently that the wing-venation has been made to play any considerable part in the classification of the beetles, its study had not altogether been neglected. Burmeister, for example, had shown that the families Carabidæ, Paussidæ, Dytiscidæ, and Gyrinidæ, possessed in common a characteristic type of wing-venation differing from that of other beetles, and on this ground had placed them together in the group Adephaga. Otto Roger, as the result of his study of the wing-venation from a phylogenetic point of view, came to the conclusion that the Malacoderms represented an ancient type from which all other beetles, except the Adephaga, might be derived. The Adephaga he considered to be a very ancient type, which had already branched off from the common stem before the Malacoderms had arrived at a stage represented by any existing forms. So that here was already suggested a division of the Coleoptera into two main groups: the Adephaga on the one side, and the Malacoderms and their derivatives on the other. As will be seen later on, a division of the Coleoptera into two suborders, the Adephaga and the Polyphaga, seems to be well justified on other grounds.

In addition to the type characteristic of the Adephaga, two

* "Systematisch-Koleopterologische Studien," in Münch. Kol. Zeit. i. p. 271 (1903).

† "Mein System der Coleopteren," in Zeitschrift für wissensch. Insektenbiol. (1908).

other types of wing-venation are, according to Ganglbauer, to be met with in the Coleoptera.

Adopting the views and the nomenclature of Comstock and Needham, he designates the chief longitudinal veins in the wing as follow:—Costa, subcosta, radius, media, cubitus, and analis. The first three run close together from the base along or quite near to the front margin of the wing. The media runs more diagonally from the base, dividing the wing into two considerable areas, which vary somewhat in their relative proportions. In the anterior area, between the media and the radius, two other longitudinal veins, one considered to be a branch (M_1) of the media and the other (R_2) a branch of the radius, may generally be recognized. In the posterior area lie the cubitus and analis and their branches.

What appears to be the most primitive condition of the wing-venation in beetles occurs in the small family Cupedidæ (Fig 1).

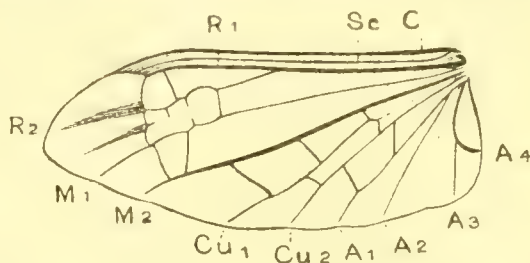


Fig. 1.—Wing of *Omma stanleyi*, Newm. (Cupedidæ.) (After Kolbe.)

Here all these veins remain in a more or less completely developed and unmodified state, and are joined together by a greater number of transverse veins than are known to occur elsewhere in the Coleoptera. The anterior branch (M_1) of the media (M_2) is a long vein running uninterruptedly almost from the base to the margin, and is joined by means of two transverse veins with the media, and by two with the posterior branch (R_2) of the radius, which itself is joined to the radius by two transverse veins. There are to be seen also two transverse veins between the cubitus and media, and two between the cubitus and analis.

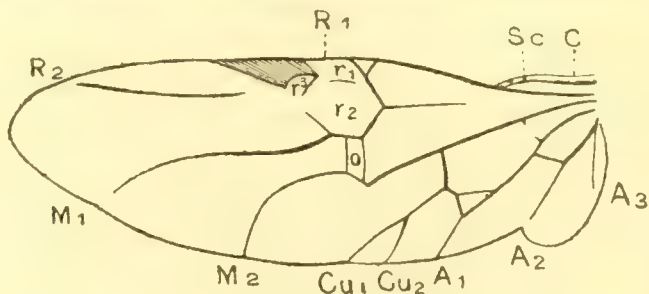


Fig. 2.—Wing of *Tachypus flavipes*, L. (Carabidæ.) (After Kempers.)

In other beetles some or all of the transverse veins have disappeared, and the anterior branch (M_2) of the media has also in some part of its length disappeared.

It is characteristic of the Adephagan wing that this branch (M_2) is joined to the media by means of one or two, generally by two, transverse veins. When two are present, an oblong cell is formed, which affords a ready means of recognizing the type.

The Adephaga generally show a modification of the simpler and more primitive type, as met with in the Cupedidæ. The anterior branch (M_2) of the media has in part disappeared, especially in the proximal area of the wing, and the media itself shows a peculiar twist or bend in its course near the point where the transverse veins join on to it (Fig. 2).

The chief characteristic of the Staphyloinoidean type of wing-venation—the second of Ganglbauer's types—lies in the disappearance of all the transverse veins, and of the proximal part of the anterior branch (M_1) of the media, the distal part only of this branch being left as an isolated vein in the apical area of the wing (Fig. 3).

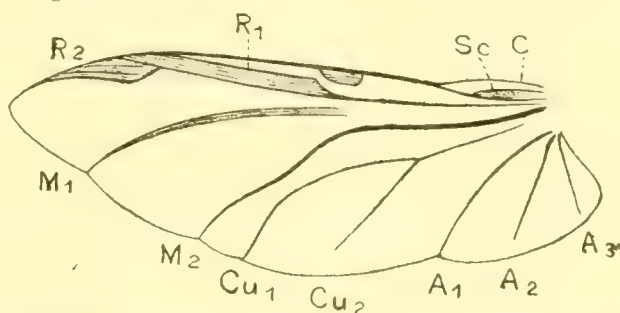


Fig. 3.—Wing of *Necrophorus vespilloides*, Herbst. (After Kempers.)

The third type of wing-venation*—the Cantharoidean type—is characterized by the curved, hook-like connection which the anterior branch (M_1) of the media makes with the media, so that it looks like a recurrent branch of the latter. In a similar manner the posterior branch (R_2) of the radius appears as a recurrent branch of that vein. The distal parts of these branches frequently appear in the apical area of the wing as radiating veins, but are sometimes altogether absent (Fig. 4).

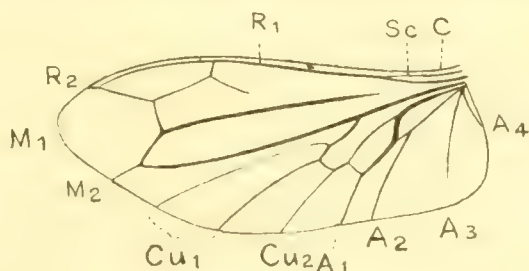


Fig. 4.—Wing of *Lampyris noctiluca*, L.

* Ganglbauer figured the wing of *Lygistopterus sanguineus* to illustrate this type. This wing wants one of the two transverse veins between A_1 and Cu_2 ; and I have substituted for it the wing of *Lampyris*, and lettered the veins in accordance with my own views.

NOTES ON THE LIFE-HISTORY OF *CHRYSOPA FLAVA*, Scopoli.

BY E. MAUDE ALDERSON, F.E.S.

(PLATE IV.)

THIS species is one of our most frequently noticed British Chrysopids. This is in part due to its being a fairly common insect, and in part to its size, it being one of the largest—if not the largest—representative of the family in this country. I have one female which measures 46 mm. in expanse; and though this is the largest individual specimen I have met with, I have others which measure from 35–37 mm.

McLachlan, in his “Monograph on the British Neuroptera Planipennia” (Trans. Ent. Soc. 1868, part ii.), says: “*C. flava* especially frequents trees bordering streams.” This is certainly true, but I do not think there is any connection between this species and water, and it is certainly quite as frequently found in gardens and woodlands.

The only other British species with which *C. flava* is likely to be confounded is *C. vittata*, Wesmael, and McLachlan has a note that these two have been constantly mixed in collections. They are of about equal size, but *C. flava* can at once be separated by the excised costal margin of the anterior wings. This character, which is constant, can be plainly seen in Mr. Main’s photograph. The fore wings seem to rise somewhat abruptly from the thorax, and then at about one-third the costa gives a distinct “dip.” *C. vittata* has a much more rounded costa, and the wings are more “ample” looking. Another good point of difference is the length of the second antennal joint in *vittata*, which is almost twice as long as in *C. flava*. *C. flava*, also, is of a richer shade of green, and possesses a broad yellow longitudinal line down the whole length of the thorax and abdomen. *C. vittata* is also lighter on the thorax, but is more wholly and uniformly pale greenish in colour.

All my specimens of *C. flava* I find on examination have been taken during the months of May and June. It must occur throughout the summer, however, as I have notes of ova found during July and August, and Mr. Main writes me that the example photographed was taken so late as August 20th. The very large female mentioned above was caught fluttering among the leaves of a climbing rose, and was evidently searching for aphides, near which to deposit her eggs. She laid thirty-nine ova on July 14th, which hatched out on the 20th of the same month. The ova have their footstalks united into a bundle, as shown in Mr. Main’s photograph. Two other groups of ova which I possessed contained sixteen and nine ova respec-

tively. The group of sixteen was found on August 14th of last year, and were evidently just laid. They hatched on the 21st, which (taken in conjunction with my former experience) seems to fix the period between oviposition and emergence at about a week. The ova are of a lovely shade of soft pearly green when deposited. Two days later they begin to change colour, becoming yellowish at the ends. They then gradually become paler in tint, until the day before hatching, when they appear wholly white, with two conspicuous brown spots at the apex—the eyes of the embryo.

The larvæ, when newly hatched, are about 2 mm. in length, of a shining transparent white, with a pearly lustre. Two rose-coloured lines run down the thorax, and continue down the abdomen. By the second day the head markings appear. They consist of two straight lines, slightly converging towards the neck; the thoracic lines continue these markings down the body. The eyes are jet-black and very conspicuous; two slight stripes run through them, along the sides of the head. The tibiæ are ringed with faint fuscous. These markings, though becoming more complicated with age, comprise the characteristic features in the general appearance of the larva in all stages. Some of them can be distinctly noted in the photograph.

The following is a description of the full-grown larva, taken from my notes made at the time:—

Length 12–13 mm. *Colour* pale straw-colour with reddish madder markings. The central area lighter, with a dark stripe running down the whole length of the back to the tail. The mottled markings on the back deepen at the sides, causing the appearance of darker side-stripes; but beyond this there is always a light line of pale straw-colour. *Sucking-spears* madder. *Antennæ* lighter in shade. *Eyes* black, with a dark line at the side of the head running up to the eye. *Head* transparent whitish. *Characteristic head markings*: two straight lines branching outwards, madder-fuscous, deepening at the ends nearest the thorax. *Prothorax* with two vertical dashes and a central spot, black. *Meso- and metathorax* each with two black dots. *Legs* straw-colour; *tarsi* dark ringed. *Underneath parts* wholly straw-coloured. In general appearance the larva is much less hairy than other species of Chrysopidæ that I have met with. It is also more cylindrical in shape (not so flat-looking). It is an extremely active larva, running about vigorously as soon as hatched, and hunts its prey, or hides itself amongst the leaves, with great rapidity. It is very cannibalistic, attacking its neighbours savagely if hungry. On each occasion, when I have bred it from the egg, I have lost more than half the batch through not removing the young larvæ as soon as hatched. The apices of the ova lying close together (owing to their being laid in groups), the young larvæ can con-

veniently rest on their own egg-shells and attack all the unhatched ova within reach. As they are extremely voracious from birth, this may result in all being lost, except those that are lucky enough to hatch simultaneously. This happened with the first batch I possessed, numbering thirty-nine ova, from which I only secured some eight or nine larvæ. I have a note at the time that the larvæ remained motionless on their egg-shells for some considerable time, and that I could not discover what they were doing. That is some five or six years ago. I know now, having had an exactly similar experience only last season, and shall always take care in future to remove the young larvæ immediately they emerge. They are not so liable to attack one another later, unless short of food; or unless one individual deliberately gets in another's way; but they will do so at all stages of growth, even when the victim is spinning.

I could not discover more than two changes of skin in my larvæ, and from the observations I have made with other species this seems to be the normal number, though it seems difficult to understand how full growth can be attained without more. The following table gives the dates of four individual larvæ:—

| Hatched. | 1st Change. | 2nd Change. | Spun up. |
|--------------------|-----------------|-----------------|-------------|
| 1. Aug. 14th | Aug. 19th | Aug. 23rd | Sept. 3rd. |
| 2. Aug. 14th | Aug. 19th | Aug. 23rd | Sept. 4th. |
| 3. Aug. 21st | Aug. 27th | Sept. 2nd | Sept. 14th. |
| 4. Aug. 21st | Aug. 27th | Sept. 2nd | Sept. 16th. |

I have never yet discovered *Chrysopa* ova earlier than midsummer, so I cannot say for certain whether the "lacewings" are double-brooded or not. My impression, however, is that they are *not*. I have kept imagines alive for a month in confinement, which seems to prove that the imaginal existence is longer than has been supposed, and few species emerge before the end of May or beginning of June in any quantity, so that it seems improbable that two broods can occur in the year. I can, however, only speak with certainty with regard to those I have bred, and in no case has the imago emerged until the following spring or summer. Emergence is not complete on the insect escaping from the cocoon, the imago being covered with a transparent pellicle, from which it frees itself by slitting the thorax. In this stage (which in a healthy example is *very* short) the wings are only 3 mm. in length, the fore wing appearing slightly shorter than the hind wing and resting above it. The eyes are of the same bright green as in the perfect insect. The antennæ are quite short, and folded round the eyes like a ram's horn. They appear to lengthen rapidly, and when fully extended are curled underneath the body. The wings show their iridescence through the pellicle, and the bright yellow line on the thorax is as distinct as in the

full emergence. It is not often one gets a chance of observing this period of the insect's existence, but in the case of the example from which my description is taken the imago was unable through weakness to cast its pupal covering, and remained for two or three days in a helpless condition. Emergence (in the case of those I bred) generally took place in the morning.

Mr. Main's experience was that, early in the season, a large percentage of emergences took place in the evening, between five and six p.m. Later in the year he observed many freshly emerged imagines, in the same spot, about eight in the morning, as he went to the station; whilst on the return journey, in the afternoon, emergences were still going on. Mr. Main was fortunate enough to be able to make these observations in a place where *C. flava* was common; and his notes have the advantage over mine that they were taken from the insects in a state of nature, whereas my imagines were reared artificially. It may, perhaps, be safe to assume that emergences take place throughout the day, in the absence of further evidence, but more observation is needed on this and many other points.

I was never fortunate enough to see either the emergence of the nymph from the cocoon, or the escape of the imago from its pupal covering. Mr. Main's impression is that the nymph, on emerging from the larval skin, cuts an opening in the cocoon, with jaws specialised for the purpose, and crawls out, the cocoon lid dropping back into its place behind it. He thinks the insect then gets a firm grip with its feet on some near object, and the imago at once escapes, from the splitting of the skin in the dorsal region. His experience coincides with mine in that, in the case of successful emergence, the whole process is a remarkably rapid one; whilst disturbance generally results in failure to cast the pupal covering and consequent death.

I am afraid these notes are very imperfect, but Mr. Main, who has kindly sent me larvæ from time to time, has asked for such observations as I can with confidence attach to this species. Some of the facts are also from notes taken some years ago, on a former occasion, when I bred *C. flava*. Other species are under observation, and I hope in time to be able to record the breeding of most of our familiar British members of the family. The larvæ are very easy to rear, and give little trouble. Moreover, their active existence is short, which makes them suitable subjects of observation for those who, like myself, have not much leisure. Further, I know of no published description of the larvæ, which makes their study more interesting; and with the help of such beautiful photographs as Mr. Main produces, the value of such notes can be much enhanced, the Chrysopids being difficult subjects for the pencil and brush.

Park House, Worksop, Notts: January 25th, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA,
SOUTH QUEENSLAND, AND TASMANIA.

By E. H. STRICKLAND (Dip. S.E.A.C.).

NEW SPECIES FOUND IN A SMALL COLLECTION OF MOSQUITOES
FROM WESTERN AUSTRALIA.

THIS collection, which was made by Dr. Cleland, of the Department of Public Health, Perth, Western Australia, was sent to Mr. F. V. Theobald.

All the twenty-two specimens sent were found to belong to the sub-family Culicinae, and at least seven of them represented species up to the present undescribed.

Some of the specimens arrived in too damaged a condition to be identified.

The new species, comprising three *Culicelsa* and one *Grahamia*, are described in detail below, together with notes on their habits, &c., made by Dr. Cleland.

Type specimens of the species have been forwarded to the British Museum.

Culicelsa westralis, n. sp.

Thorax clothed with golden brown scales with three longitudinal lines of white scales. There is also a patch of white scales before the similarly clothed scutellum. Abdomen black with snowy white basal bands.

Legs with black tarsi which have conspicuous snowy white basal bands. Femora and tibiæ pale scaled ventrally.

♀. Head black with large creamy narrow curved scales round the median line and back of head, and smaller narrow curved scales at the sides and round the eyes. The lateral flat scales are for the greater part white, but there is a deep purple band at the sides of the head. The upright forked scales are black. Eyes, silvery. Antennæ with basal segment dark and bearing a few white flat scales and black hairs. Palpi with black and white mottled scales, which are mostly white at the apex. Proboscis not mottled.

Thorax brown with three narrow longitudinal black lines, clothed on the apical two-thirds with golden brown narrow curved scales, which become larger and whiter on the basal third. There are also three indistinct lines of white scales stretching along the black lines of the thorax from the white patch, the median of which almost reaches the head, whereas the lateral lines terminate a little beyond the centre of the thorax in two more or less distinct white spots. Scutellum clothed with white narrow curved scales. Prothoracic lobes with small white narrow curved scales and black bristles. Pleuræ with white flat scales. Abdomen black with well-defined white basal bands on all segments. A slight apical banding also is present on the two apical segments. Ventral surface with white scales except for a small dark central spot on each segment.

Legs with very distinct white basal bands, femora with a slight

apical band also, they are mottled with black and white scales all over. Femora, tibiæ, and metatarsi mostly white scaled below. Tarsi deep black all over except for the white basal bands.

Wings rather densely scaled with black scales. First fork cell considerably longer and narrower than the second fork cell, its stem somewhat over half the length of the cell. Supernumerary and mid cross-veins in a line with each other, posterior cross-vein about its own length distant from the mid cross-vein. Halteres with light stems and dark knobs which bear small white scales.

Length 5-6.5 mm.

Hab. Western Australia.

Observations.—Described from three females.

Of two of the specimens identified as belonging to this species Dr. Cleland says:—"King's Park, Perth, and in closet, Perth . . . Vicious. Bites by day and all the year round." Specimen taken September 23th, 1906, and of the third, referring to the larvæ from which the specimen was hatched:—"Overflow from Port River, Adelaide, clear but still water. Salt, though perhaps not quite as salt as the sea. Enormous numbers of larvæ, especially in the shade. Most remained about four inches under water, occasionally coming up to surface. There seemed to be a stratum at this layer as various things floated there. Pupæ appeared January 29th, 1906; nymphs, January 31st, 1906."

The species is allied to *Culicelsa alboannulatus*, Macquart, but can be at once distinguished from it by the absence of a white ring near the apex of the femora.

Culicelsa uniformis, n. sp.

Thorax uniformly clothed with golden brown scales, except just before the scutellum where they are paler. Scutellum with creamy scales. Abdomen black with light ochreous basal bands. Tarsi black with snowy white basal bands.

♀. Head black with creamy narrow curved scales at the back, more golden brown in front. The upright forked scales are black. The flat scales are black and white in patches. Palpi dark scaled with a few white scales and hairs at the apex.

Thorax black with uniform golden brown narrow curved scales, except before the scutellum where they are of a lighter colour. Scutellum with creamy narrow curved scales. Prothoracic lobes with ochreous narrow curved scales, spindle-shaped scales and bristles. Pleuræ with ochreous and white scales. Abdomen basally banded with light ochreous scales. Apical segment mottled and apically banded, the basal band is absent. The next segment is both apically and basally banded. Ventral surface creamy scaled. Femora mottled, ochreous and dark, knee spot ochreous. Tibiæ unbanded. Tarsi with sharply defined white basal bands. First and second legs with last two tarsi unbanded. Hind legs with all tarsi banded.

Wings not very densely scaled. First fork cell longer and

narrower than the second posterior cell, its stem over half the length of the cell. Supernumerary cross-vein slightly nearer the base of the wing than the mid cross-vein. Hind cross-vein slightly more than its own length distant from the mid cross-vein. Halteres with ochreous stems and knobs, the latter bearing ochreous scales.

Length 4.5–5 mm.

Observations.—Described from two somewhat damaged females. It is closely related to *Culicelsa westralis*, n. sp., but the uniform thorax separates it from this species. It also comes near *Culicelsa togoi*, Theobald, but has ochreous banding on the abdomen, whereas the latter has snowy white bands.

Dr. Cleland's notes on this species are:—(1) "King's Park, Perth, and in closet, Perth. Vicious. Bites by day and all the year round." (2) "Port River swamps, Adelaide. Bites severely, raising weals even in strong sunlight in the open and with a moderate breeze."

The dates of capture were March 28th, 1907, and January 26th, 1906, respectively.

Culicelsa similis, n. sp.

Thorax uniformly clothed with golden brown scales, except just before the scutellum where they are paler. Scutellum with ochreous scales. Abdominal bands white laterally, and ochreous on median area. Tarsal bands snowy white.

♀. Head black with creamy narrow curved scales, black up-right forked scales, and flat scales in black and white patches. Palpi rather long, black with white apical scales, and a few white scales at the juncture of the second and third segments. Proboscis long.

Thorax black, clothed with uniform golden brown scales, which become paler before the scutellum. Scutellum with ochreous narrow curved scales. Pleuræ and prothoracic lobes with ochreous scales. Abdomen basally banded, bands white laterally but ochreous on median area. Apical segments not mottled, and without apical banding. Femora not mottled, dark scaled above, pale scaled below on basal half. Knee spot ochreous. Tarsi with well-defined white bands on most joints. Fore legs with three apical tarsi unbanded. Mid legs with two apical tarsi unbanded, and hind legs with apical tarsus unbanded. First fork cell longer and distinctly narrower than the second posterior, its stem not over half the length of the cell. Hind cross-vein almost one and a half times its own length distant from the mid cross-vein. Halteres with almost white stems, knobs blackish with white scales.

Length 4.5–5 mm.

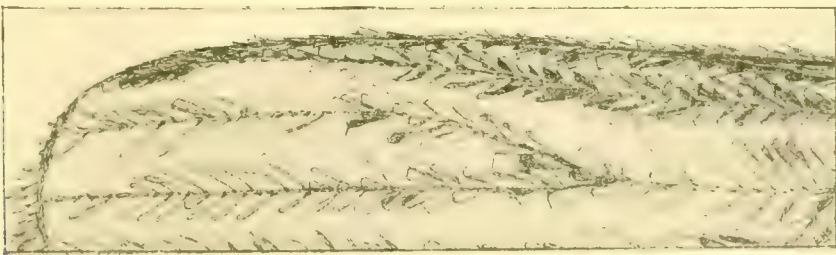
Observations.—Described from a single perfect female. This is evidently very closely related to *Culicelsa uniformis*, n. sp., but can easily be separated by possessing white lateral scales to the abdominal bands. The halteres also are quite distinctive.

"Mt. Lofty, South Australia, January 9th, 1906. Caught in day by disturbing bushes, &c., near stationary pool of water. Bite severely."

Grabhamia australis, n. sp.

This is a large, clumsily built species. Thorax densely clothed with rich brown scales. Scutellum with white scales. Abdomen dark scaled basally, lighter apically with indistinct narrow basal bands. Legs with tarsi unbanded. Wing scales mottled.

♀. Head densely scaled, and with a few long bristles. The curved scales are large and white in colour, except at the borders of the eyes where they are smaller and of a deep golden brown. The upright forked scales are numerous and all black. The flat scales at the sides of the head are mostly white, though a part of their area is covered with purplish dark scales. The eyes are mainly silvery but have large dark black irregular patches. Clypeus shiny black. Palpi densely clothed with dark scales, and a few outstanding bristles. Proboscis covered with mixed dark and white scales, giving it a mottled appearance. The basal joint of the antennæ is clothed with small dark hair-like bristles and a few small narrow flat white scales. Mesonotum dark brown thickly clothed with deep golden brown narrow curved scales, which are larger and of a white colour just before the scutellum. Three rows of bristles are also present, the central one of which is somewhat irregular. Scutellum with large white narrow curved scales and a few long bristles on the lateral lobes. Prothoracic lobes with white curved and hair-like scales. Pleuræ plentifully covered with white flat scales. Abdomen mainly covered with dark flat scales of a violaceous reflection,



Portion of wing of *Grabhamia australis*, n. sp.

which become lighter in colour on the apical segments. First segment with a few whitish scattered scales. Small white lateral apical spots on the second segment, and a pale indistinct apical band consisting of a single row of scales is first noticed on the third segment. It becomes more pronounced on the succeeding segments, except on apical where it becomes merged into the general pale coloured scales covering the whole segment. The lateral spots also become more distinct on the third and succeeding segments. The ventral surface of the abdomen is almost entirely covered with white scales.

Wings large, longer than the abdomen; veins, except at the apex where the scales are culex-like, clothed with mixed dark and white *Taniorhynchus*-like scales. The dark scales which are brown in colour with a purplish reflection are the most numerous. The first submarginal cell is slightly narrower though somewhat longer than

the second posterior cell, its stem is not half the length of the cell. Posterior cross-vein about its own length from the mid cross-vein.

Legs with femora, tibiæ, and metatarsi mottled with brown and white scales. The apices of all the femora are white. White incomplete basal bands are just visible on one or two of the tarsal joints, particularly the second posterior tarsi, but appear to be absent as a general rule.

Length 7.5 mm.

Observations.—Described from a single female. It is a very marked, large, rather clumsily built species.

Locality and date of capture.—"Serpentine, Darling Range, near Perth, W. A., October 21st, 1906."

Note.—This species is placed in *Grabhamia* on squamous characters only, though it appears to be a much larger and more solidly built species than any so far described in that genus. As only one specimen was received, structural characters by dissection could not be made out.

(To be continued.)

NEMOURA DUBITANS, MORTON, A SPECIES OF PLECOPTERA NEW TO THE BRITISH FAUNA.

By KENNETH J. MORTON, F.E.S.

THE list of British Neuroptera, even when the term is used in its most comprehensive sense, is comparatively so short that any addition to it is a matter of considerable interest. It was therefore satisfactory to find in a small collection sent by Lt.-Colonel C. G. Nurse for determination a male example of *Nemoura* that seemed to be different from any of our known British species. Permission having been obtained to detach the abdomen for more thorough study, I am now able to determine the insect with certainty as *Nemoura dubitans*.

The specimen was taken at West Stow, Suffolk, on April 11th, 1910, and as the time and place of its occurrence are known to Lt.-Colonel Nurse, there is a reasonable hope that he will be able to find the insect in numbers.

The species was originally described in the Trans. Ent. Soc. Lond., 1894, p. 565, pl. xiii., from dried examples taken by Dr. Fr. Ris at Oerlikon, near Zürich, in April and May, 1889. Any hesitation about the validity of the species was dispelled by Dr. Ris, who made a preparation of the genitalia of the male type for his figures in his paper, "Die schweizerischen Arten der Perliden-Gattung *Nemura*" (Mitt. schweiz. entom. Gesellschaft, Bd. 10, Heft 9), and proved the species to be very distinct. It remained otherwise unknown until a male and a female were recorded by Petersen from near Randers, in Denmark ('Danmarks Fauna, Pseudoneuropteren'; Copenhagen, 1910).

AN ALGERIAN HOLIDAY.

BY A. E. GIBBS, F.E.S.

(PLATES V. & VI.)*

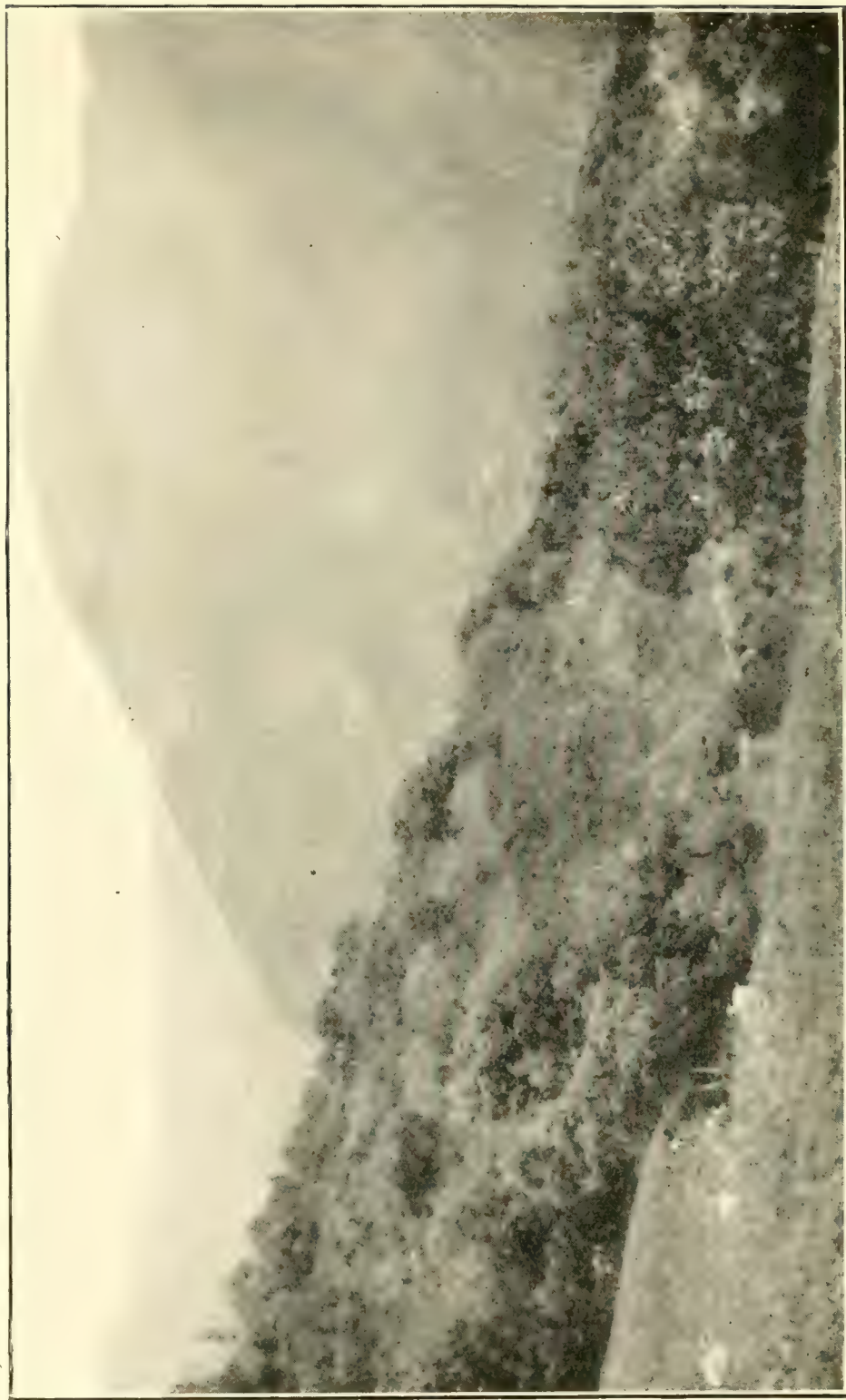
IN May, 1910, I went with my family to Vernet-les-Bains, in the Eastern Pyrenees, in search of butterflies. The weather proved to be wet, windy, and cold, and although we had four nets at work, the result at the end of the first fortnight was so poor, and the outlook so unpromising, that I resolved to seek pastures new. If the sunshine would not come to me, I must go and seek the sunshine. From the hill-tops around Vernet it is possible to see the Mediterranean, and I remembered that on the further side of that sea was the land of Barbary. Surely there sunshine would be found, so I resolved to go and try my fortunes in the land of mosques and minarets. Leaving my family in the comfortable quarters of the Hotel Mercador, at Vernet, I sailed from Port Vendres and arrived at Algiers on Monday, May 23rd. The weather continuing unsettled, a couple of days were spent exploring the sights of this bewildering city, where the Orient seems to meet the Occident, the North the South. Mingled with plants and trees familiar to our English eyes one finds vegetation of a semi-tropical character. The squares are shaded by palms; avenues of eucalyptus trees are planted along the roads; in the gardens one gets glimpses of orange trees with their golden burden, or of lemons heavy with fruit. The only butterflies I saw in Algiers were some "whites," probably *Pieris rapæ*, and a single specimen of *Gonepteryx cleopatra*, flying in the Arab cemetery.

The physical features of Algeria present some points of interest. The country may be divided into three regions. First, we have what is known as the Tell, the narrow strip of cultivated land lying between the mountains and the sea. It is some hundreds of miles in length, and varies in width from about thirty to about one hundred miles. It is not, however, one long continuous plain, but is broken up by the hills into various small parts. The Tell is one of the most fertile regions in the north temperate zone, its rich black deep soil yielding abounding crops of grain. Oranges, lemons, figs, pomegranates, olives, and other fruits flourish. Then we have the second region formed by the elevated land behind the Tell, and spoken of collectively as the Atlas. In the north we have the range known as the Little Atlas. Although the general direction of the mountains is east and west, the Atlas does not form one long continuous range, as we find in the Pyrenees for instance, but it is split up into a number of small ranges or spurs, in complex folds, sometimes forming groups of high mountains, and sometimes rugged hills

* Plate VI. will appear in the 'Entomologist' for May.

of much lesser altitude. Away to the south there is another range which is spoken of as the Great Atlas or the Atlas of the Sahara, and these two belts of mountains form the retaining walls, so to speak, of the high, barren, uncultivated plains covered with esparto grass and interminable scrub, known as the High Plateaux. Further south, beyond these highlands, we reach the third region, the Great Desert, with its waterless plains and sands, which are a barrier that few animals can pass, and form part of the southern boundary of the Palæarctic region. My collecting was chiefly done on the lower slopes of the mountains immediately above the Tell, and I was not able to investigate the insect fauna of the higher altitudes.

I unfurled my net at Blidah, an interesting little walled town pleasantly situated at the foot of one of the spurs of the Atlas. Blidah is surrounded by orange and lemon orchards, olive groves and vineyards, and has a very attractive appearance. Immediately I had secured accommodation at the hotel, I made my way through the nearest town gate and found myself on the river bank. Crossing by a footbridge I climbed the hill and presently found a grassy and sheltered hollow where I caught a *Cænonympha*, which I took to be *C. arcania*, but a second glance revealed the large apical ocelli of the under sides of the fore wings and the narrow white bands, little more than lines, on the hind wings, and I was delighted to recognize that I had already secured a species which was new to me, and which I could not name until I returned to England, when I found it to be *C. arcanioides*, Pier. Needless to say, I searched for others, and by beating the herbage five specimens were secured. The southern, brightly coloured form of *Parage egeria*, not differing greatly from those I had been taking at Vernet, was also in evidence, and was a common species in Algeria wherever I collected. In the west of the colony I subsequently took females that I suppose would be referable to var. *intermedia*, Tutt, some of the markings being straw-coloured, as in our British *P. egerides*, giving the insect a mottled appearance. *G. cleopatra* in excellent condition, the only one I actually caught in Algeria, was overtaken flying along a hedgerow. *Pieris rapæ* and *P. napi* were also taken, but proved to be quite ordinary forms of those species and indistinguishable from those I get in my garden at St. Albans. The first-named insect, *P. rapæ*, was in great abundance wherever I went, but this is the only record I have of the occurrence of its congener in Algeria. Of *P. rapæ* I took a long series in various places, hoping to find *P. manni* among them, but in this I was disappointed. The bag also included *Pyrameis cardui* and *Rumicia phlæas*. The sunshine had made my heart rejoice, but while I was at lunch the clouds rolled up again, and entomological work for the day was over. I beguiled the time seeing the sights of the town and watching the Arabs buying



A. E. G. PHOTO.

WHERE EUPHENO FLIES.

The Atlas above Blidah.

G. & S. LTD., IMP.

and selling in the native market. The plants and trees in the gardens surrounding the suburban villas and in the public park proved to be of great interest, while a grove of old olives, gnarled and weather-worn, surrounding the tomb of a holy man was very attractive. Early next morning I started for the mountains, accompanied by an Arab guide named Mohamet-ben-Hamet Kenitchou, whom I had picked up in the street, or, rather, who had picked me up, for he attached himself to me and because of his importunities I engaged him. The weather looked more promising and I hoped for great things, but, alas! my anticipations were again doomed to disappointment. The route first led through olive and fig gardens, above which we came to considerable stretches of arable land, and still higher was a zone of barren ground where grew bracken, asphodel, &c. Soon we entered a region covered with cistuses, hawthorns, genistas, and the scrubby dwarf oaks whose sweet acorns furnish food to the natives, and under their shade I found the mountain daisy (*Bellis montana*), beautiful tulips of a pretty orange colour, sedums and many other interesting plants. On this broken ground I took, during some brief intervals of sunshine, the few butterflies I caught on my climb. The bright yellow insect flying among the bushes was surely *Euchloë eupheno*, one of the butterflies I was especially anxious to obtain! A dash among the oaks and it was secured, and there without doubt was that lovely little Pierid in the net. Another, a female this time, made the pair, taken at Blidah, a spot at which in a decent summer I believe this species is to be found as abundantly as is its near relative *E. euphenoides* at Vernet. Later on I took another male at Tlemçen, but these were the only three specimens I saw. *Anthocharis belia* var. *ausonia* was added to the list, and a few *C. arcanioides*, three *Everes argiades*, and some insects of lesser note made up the day's catch. Most of the sport occurred in the neighbourhood of the little hotel known as La Glacière, where we had lunch, and here I believe very passable quarters may be found. It is apparently an excellent locality, and under better meteorological conditions would repay working. Resuming the climb we reached the cedar forest, where there are some very fine trees to be seen. Mounting still higher we attained the summit of Abd-el-Kadir, about 5350 ft. above the sea-level. Unfortunately the mountain was enveloped in cloud, but after waiting some time the mists at last divided and we got a glimpse, though only a momentary one, of a glorious landscape, the flat fertile plain stretching right away to the hills on the coast which shut out the view of the sea. On the journey home Mohamet lost his way, and we were wandering about a considerable time before he found his bearings. When we arrived at Blidah he demanded double pay. Had he not missed the path and so gone further than he bargained for, and, besides, had he not worn out his slippers scrambling

over the rough hillside in my service ! After a good deal of talk the matter had to be compromised, and I was glad to get rid of him.

I arrived late at night at Hammam R'Irha, a well-known bathing resort with a very comfortable hotel, situated among the mountains some distance to the south-west of Blidah, at an elevation of 1900 ft. above sea-level. When I left my bedroom in the morning I found that I had reached a very charming spot. As I sat at breakfast some pretty birds of a species unknown to me were pecking the dates from a palm outside the window. The air was filled with a delicious perfume from the roses and other flowers growing in the extensive gardens, and the sunshine made the place seem a veritable paradise. But, as was so often the case, a bright morning was followed by a gloomy day. Hurrying out with my net I worked round the gardens and then along a road leading to the forest. In a meadow by the wayside I was pleased to take the beautiful Algerian form of *Epinephele jurtina*, known as *fortunata*, which very much resembles the better-known *hispulla*, but is larger and more brilliant. Especially is this the case during life, for when killed much of the brightness which is so striking a feature in the living insect disappears. After this there was no more sun, and consequently no more butterflies, but in a forest clearing I found at rest on the flower heads a Zygenid which I have not yet determined. I struck a woodland path along which I wandered until it began to rain, when instead of retracing my steps I tried to take a short cut through the undergrowth and, of course, lost myself. The rain became a steady downpour, a state of things for which I was unprepared. After a rough-and-tumble scramble up and down the mountain-side I at length hit upon a clearing where an Arab boy was at work, and he showed me the way down into the valley. Here I found some native dwellings, and the Arabs told me to follow a cart track, which ultimately led me to the hotel. The remainder of the day had to be spent indoors, for the heavy rain continued until evening. The day's bag consisted only of three burnets, two *E. var. fortunata*, one *Colias edusa*, one *E. megæra*, and one *E. egeria*. Towards evening the storm abated and I determined to push on towards the Great Desert by way of the Saida and Colomb Béchar Railway, which joins the main Algiers-Oran line at a place called Perrégaux. In order to catch the west-bound night express, I had to change trains at the little station of Afronville, when a wait of two hours was relieved by catching a few Noctuæ on the station lamps and by watching the comet—Mademoiselle Halley, the French called it—which was shining with great brilliancy, and quite came up to one's idea of what a respectable comet ought to be. At five o'clock the next morning I was awakened by the guard, and turned out of my berth to find we were approaching Perrégaux. From here we travelled through

a poor country, with range after range of low barren hills, a very different land from the rich and fertile plain I had left behind me. About mid-day we reached Saida, a garrison town newly laid out, and in a very unfinished condition, with an indifferent hotel. The morning had again been a fine one, and immediately after lunch I hurried out of the town, and near a negro village found a grassy place by the river which the rains had turned into a swamp. However, I trampled up a number of *E. var. fortunata*, all males, and a *Melanargia*, which turned out to be *M. lucasi*, a species of which I should no doubt have got a better series had the meteorological conditions been more favourable. The swamps and ditches and very wet grass prevented me working the ground properly, and there was no sun to make the insects fly, so I only succeeded in catching two specimens and a half, for number three had received unwelcome attention from a lizard or a bird, and had lost a large part of both of the hind wings. Others were seen, but a chase was impossible. Several Pierids were captured, which proved to be quite ordinary *Pieris rapæ*, but one nice specimen of *Anthocharis belemia* var. *glauce*, helped to make amends. While I was watching an Arab funeral cross the bridge I noticed that heavy clouds were rolling up and the sky became so threatening that I thought it advisable to return to the hotel and make the best of the sorry comfort it afforded. Hardly had shelter been gained when the storm broke and there was another of the deluges of rain to which I was getting accustomed in Algeria. There was no train leaving for the south until the evening of the following day, so I made up my mind to retrace my steps to the more fertile and attractive regions near the coast. At five o'clock on the morning of May 29th, when I left Saida and turned my face north again, the rain was coming down as hard as ever, and so it continued for the greater part of the day. As we got near Oran the weather cleared up again, and from the carriage window one could see *Pieris rapæ* and *Colibris edusa* flying in the cornfields.

Oran is a large and important place of 88,000 inhabitants, about half of whom are French, and the district round is highly cultivated. On the morning after my arrival a visit was paid to the racecourse, not for the usual purposes for which such places are frequented, but because the landlord of the hotel thought it was the most likely place for butterflies. Alighting from the tram the exhilarating sight of *Dryas pandora* raised hopes of better fortune. *Pandora* is a strong flier, and the chances of taking it on the wing are not great, and a hot run only ended when my quarry sailed lightly over a garden wall and became lost to sight. The two Pierines I had seen from the train were flying everywhere, and so too was that ubiquitous insect, *Pyrameis cardui*, which is very abundant in Algeria. From some low bushes I turned out *Epinephele passiphæ* var. *philippina*, but the strong

wind which was blowing in this very exposed place allowed me to secure only two of them, and they were not in prime condition ; but a little further inland in a stoneyard I picked up *A. belemia* var. *glauca*. This was hardly out of the net before *C. edusa* var. *helice* attracted attention, and proved to be an extremely fine and large specimen, measuring when set 53 mm. from tip to tip of the expanded wings.

(To be concluded.)

A NEW GENUS OF AUSTRALIAN BEES.

By T. D. A. COCKERELL.

IN the 'Entomologist,' October, 1910, I gave an account of some small and very peculiar Australian bees. I have now received from Mr. Rowland Turner a number of specimens, including two new species which must be assigned to still another genus, remarkable for the fact that the third discoidal and second submarginal cells are completely confluent. The types will be placed in the British Museum.

HETERAPIS, n. gen.

Small bees related to *Euryglossa* ; stigma large ; marginal cell pointed on costa ; first submarginal and first and second discoidal cells complete ; third discoidal and second submarginal confluent, the nervure which should separate them wholly absent ; lower section of basal nervure arched, falling far short of transversomedial ; claws in female cleft, pulvillus large ; anterior tarsi with modified hairs ; suture between clypeus and supraclypeal area obliterated. Type *H. delicata*, n. sp.

Heterapis delicata, n. sp.

♀. Length about $3\frac{1}{2}$ mm. ; elongate, black, with hyaline wings ; mandibles and labrum pale reddish, as also apical middle of clypeus ; mandibles dark and bidentate at apex ; inner orbits very narrowly margined with yellow ; antennæ pale beneath, including a stripe on scape ; abdomen faintly purplish, the first segment smooth, the others microscopically transversely lineolate. Ocelli large, in a triangle ; head oblong, like some Proctotrypid ; mesothorax very minutely punctured and lineolate ; metathorax elongated, longer than broad, with a large upper surface, which is microscopically cancellate ; abdomen not much longer than thorax. Anterior tibiæ yellow in front ; hind tibiæ with base broadly yellowish-white ; anterior tarsi pale reddish, beneath with curious thick subclavate hairs ; claws bifid at end ; pulvillus very large. Base of mandibles making an angle with base of eye, as in *Turnerella* ; facial foveæ linear ; clypeus not defined above, but from its lateral sutures evidently very high, its upper suture wholly wanting, its surface with sparse minute piliferous punctures and feeble microscopical lineolation ; antennæ 12-jointed,

joints beyond the fourth with small oval whitish pits; long branched hairs on abdomen beneath near end, and short plumose ones about tubercles. Stigma and veins dark brown, well formed; in the following account of the wing the measurements are in microns (the same also under the next species); stigma very large and deep, its depth 153; marginal cell sharply pointed on costa, its length on costa 357, its lower side beyond the submarginal cells slightly arched inward; first submarginal long, its length 290; second submarginal on marginal 85, its lower side absent; upper section of basal nervure 34, lower (not allowing for the curve) 220; basal nervure from transversomedial 60, the latter oblique, and bent at its lower end; first recurrent nervure joining first submarginal cell 12 from its end.

Hab.—Mackay, Queensland, December, 1899 (*Turner*, 388).

Heterapis sculpta, n. sp.

♀. Length about 4 mm.; slender; head and thorax black, abdomen shining rufopiceous; tubercles margined with yellow; mandibles ferruginous, dark at extreme base, feebly bidentate at apex; labrum dark; scape in front and flagellum beneath pale yellowish-ferruginous; knees, anterior tibiæ, middle and hind tibiæ at base and apex, and all the tarsi, pale ferruginous; wings hyaline, very iridescent, nervures and stigma dark brown; tegulæ brown. Clypeus and adjacent sides of face microscopically tessellate, with large shallow punctures; clypeus very long, separated from the supraclypeal area by a slight depression, but no suture; supraclypeal area finely longitudinally striate; a fine longitudinal keel between antennæ and reaching far up front; ocelli large, middle ocellus 100 μ diameter; front very strongly punctured; second antennal joint oval, fourth and fifth very short; flagellum stout, subclavate, the penultimate joint 135 μ diameter; mesothorax shining, strongly and very regularly punctured; abdomen beyond first segment finely transversely lineolate; metathorax microscopically reticulate. Claws deeply bifid, pulvillus large; anterior tarsi with hooked bristles; hair on under side of abdomen branched on one side. Stigma large, only moderately deep, its depth 153; second submarginal and third discoidal cells completely confluent; upper section of basal nervure 102; lower section very strongly arched, falling 135 short of transversomedial; marginal cell 714 long, pointed on costa; first submarginal 460; second submarginal above 93, its lower side absent.

Compared with *H. delicata*, this is considerably larger; the head is differently shaped, being broad above, with the eyes strongly converging below; the metathorax is much less elongated, and is rounded in lateral profile (angular in *delicata*); the abdomen is broadest about the base of the second segment, whereas in *delicata* it is broadest about the middle of the third.

Hab.—Mackay, Queensland, May, 1900 (*Turner*, 1087).

Euryglossa perpusilla, Ckll., 1910.

Mr. Turner sends me several females of this species (*Turner*, 1085). The orange supraclypeal band is sometimes absent.

One specimen has a *Turnerella*-like venation, with only one submarginal cell and two discoidals. The shape of the remaining submarginal is as in *E. perpusilla*, not at all as in *Turnerella*.

Bombus bicoloratus.—In my note on this species, p. 101, I used the customary sign for workers, but for some reason the printer desired to spell it out, and rendered it "hermaphrodites."

NEW SPECIES OF SYNTOMIDÆ FROM BRITISH GUIANA AND SOUTH BRAZIL.

By W. J. KAYE, F.E.S.

Pterygopterus flavicornis, n. sp.

♀. Blue-black; antennæ orange, blackish close to base. Abdomen with metallic-blue patches at base, and an ill-defined lateral stripe of metallic spots. Fore wing with the outer marginal half dull blackish, the remainder of wing deep green. The median vein and upper discocellular bright blue-green. Hind wing dark shot blue-green. Under side of both fore and hind wings suffused with brilliant metallic-green, the veins at the margin of wings only so coloured, the interspaces black. Differs only from *P. claripennis* (male) in the antennæ, which are wholly orange in the insect now described, while *claripennis* has only the tips orange. Expanse, 56 mm.

The shape of the hind wing is totally different, but is probably a sexual difference. The female of *P. claripennis* is unknown.

Hab. Potaro River, British Guiana, June 18th, 1904 (C. B. Roberts).

Pseudosphex polybia, n. sp.

Head black. Thorax black. Eyes finely white-ringed. Antennæ blue-black for basal two-thirds, the slender apical third dead black. Abdomen black, with an oblique whitish streak on attenuated basal segment at side. Fore wing yellowish hyaline, with the costa broadly suffused with brownish. Hind wing more yellowish hyaline. Legs yellow, with the inside of femur velvety black. Expanse, 26 mm.

Hab. Castro, Parana, Brazil, April 14th, 1910 (W. J. Kaye).

Pseudosphex jonesi.

Head black; eyes narrowly ringed with white. Antennæ purplish for basal two-thirds, brownish for the attenuated apical third. Abdomen shining brown above, ringed with yellow beneath. Wings hyaline with a tinge of yellowish. Legs yellowish, the femora darker. Expanse, 20 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (E. D. Jones).

Rhyncopyga braconida.

Small white points below the eyes, on edge of patagia, and on base of fore wing below. Head and thorax dull lustrous green. Abdomen with the two basal segments crimson, the remaining segments greenish black. Legs greenish black, the third pair very long and white beneath at the joint of tibia and femur. Fore wing with basal half dark lustrous green, the outer half dull blackish. A large orange spot on costa beyond the cell. Hind wing blackish, slightly diaphanous. Expanse, 28 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (W. J. Kaye).

Mystrocneme sectum, n. sp.

Frons white. A white spot on the shoulder. Thorax black, with a large metallic-green spot in centre; patagia with metallic-green spots. Collar with two metallic-green spots. Abdomen with a white sublateral spot at base, and with metallic-green lateral stripes. Fore wing black, with a small hyaline streak just below the cell. Hind wing entirely black. Expanse, 28 mm.

Hab. Potaro River, British Guiana, March 22nd, 1904 (C. B. Roberts).

Mystrocneme rubricorpus, n. sp.

Frons white. Collar with two green spots. A crimson spot at base of shoulder. Thorax black; patagia with slender metallic-green stripes. Abdomen with first and second segments scarlet, the third, fourth, and fifth scarlet laterally, black dorsally; the remaining segments black, with some metallic-green scaling laterally. Fore wing hyaline; the apex broadly black; a large black square-shaped patch at tornus; inner margin broadly black; the costa narrowly black. Hind wing hyaline, with a broad black margin; the cell area black. Under side of hind wing with metallic-green scaling at base of costa and in cell. Tibia with metallic-green scales on outside. Expanse, 28 mm.

Hab. Potaro River, British Guiana, April, 1903 (C. B. Roberts).

Mystrocneme albicorpus, n. sp.

Black; frons, shoulders, and coxæ with white spots. Legs outwardly with metallic-green areas. Abdomen with the basal segment white, and the second segment edged internally with white; laterally these two segments are overlaid with pale metallic-green; the other segments green laterally and black dorsally. Abdomen beneath with a central broad whitish stripe, and a short whitish lateral streak on two first segments. Fore wing hyaline, with a broad black apical patch, and a broad black area across cell. Hind wing hyaline, the margins broadly black. Expanse, 28 mm.

Hab. Potaro River, British Guiana, June, 1903 (C. B. Roberts).

Napata subflavescens, n. sp.

Base of antennæ with small white points; front edge of patagia orange. Thorax and abdomen blackish brown. Fore wing brownish

black, with a broad transverse ochreous band across middle; costal edge for some distance from base yellow. Hind wing wholly brownish black. Under side of fore wing as on upper side. Under side of hind wing pale yellow, with a broad marginal black band, and some blackish streaks in and about the cell; the marginal band near anal angle is broken with a wedge of pale yellowish. Expanse, 33 mm.

Hab. Bartica, British Guiana, April 7th, 1910 (W. J. Kaye).

Saurita melanifera.

Head, abdomen, thorax, antennæ, fore wing and hind wing, both above and below, completely sooty black. Expanse, 27 mm.

Hab. Guaruja, Santos, South Brazil, March 2nd, 1910 (W. J. Kaye).

Saurita mediorubra, n. sp.

Head, thorax, and abdomen black. Large crimson spot at base of patagia, and another large crimson spot in the centre of the first segment. Fore wing semihyaline, the apex broadly black; some dark scaling at tornus, and at base and along inner margin for a short distance. Hind wing semihyaline; the apex and inner margin with some dark scaling. Legs entirely black, and under side of abdomen entirely black. Expanse, 34 mm.

Hab. Guaruja, Santos, South Brazil, May 9th, 1910 (E. D. Jones).

Trichura grandis, n. sp.

Frons metallic-green. Head, thorax, and abdomen black, the latter with a few lateral shot-green spots; at base of first segment a metallic-green central spot. Fore wing ochreous hyaline; costa margined narrowly on outward half with blackish; outer margin narrowly black, slightly extending inwards near tornus; inner margin very narrowly blackish. Hind wing hyaline, almost devoid of colour; the apex and inner margin broadly black; outer margin very lightly margined black. On under side pairs of subdorsal white patches on third and fifth segments. Legs black, shot with dark green. Expanse, 50 mm.

Hab. Guaruja, Santos, South Brazil, February 27th, 1910 (W. J. Kaye, E. D. Jones).

Leucotmemis bella, n. sp.

Frons white. Two metallic-blue spots behind the eyes. Collar orange. Thorax and patagia orange. Abdomen orange, with a slender dorsal line of metallic-blue spots; last four segments black, with patches of metallic-blue scales. Fore wing yellowish, transparent, the basal two-thirds of costa and basal half of inner margin orange; apex broadly black, and outer margin narrowly black, very slightly extended inwards at vein two. Hind wing hyaline, with inner margin and apex broadly black. Legs with coxa and femur orange, tibia blackish, tarsus whitish. Under side of abdomen orange, the last four segments black. Expanse, 27 mm.

Hab. Alto da Serra, Santos, Brazil, March 6th, 1910 (W. J. Kaye).

Loxophlebia inconspicuata, n. sp.

Head black. Thorax and patagia brick-red. Abdomen brownish black, with a sublateral whitish line. Fore wing transparent, with the margins narrowly black, and the base markedly black. Hind wing transparent, slenderly margined with black. Legs brownish, with patches of whitish scales. Expanse, 19 mm.

Hab. Potaro River, British Guiana, March 25th, 1903 (C. B. Roberts).

Loxophlebia fininigra, n. sp.

Palpi black, with white rings at the joints. Head black, with white points above and below antennæ. Thorax orange. Abdomen orange; seventh and eighth segments black, ninth segment metallic-greenish. Fore wing transparent, the base orange; the apex broadly black, and outer margin narrowly black, extending inwards at vein two. Hind wing transparent, the margin narrowly black. Antennæ black, the tips brown, preceded by a short length of white. Under side of abdomen black, with a large white basal patch. Expanse, 22 mm.

Hab. Guaruja, Santos, South Brazil, April 17th, 1910 (W. J. Kaye).

Mesothen perflava, n. sp.

Palpi black; frons white; back of head black. Collar yellow; patagia yellow, with a central black line. Thorax yellow, with central black line continuing down the back of the yellow abdomen to the fifth segment; segments six and seven wholly yellow; the eighth blackish, and the last black, with two patches of white scales. Fore wing hyaline; no discoidal spot; the margin narrowly black, except the apex; nervures at base yellow-scaled. Hind wing hyaline, narrowly margined with black. Legs yellow, edged with black on the outside. Expanse, 24 mm.

Hab. Alto da Serra, Santos, Brazil, 2600 ft., March, 1910 (E. D. Jones).

Allied to *Mesothen rogenhoferi*, Schs., and perhaps only a variety of same.

Argyrooides variegata, n. sp.

Head black, thorax black, the patagia with crimson stripes. Abdomen black; the second, third, and last three segments with dorsal pairs of pale blue spots; the fifth segment with a partial yellow band. Fore wing diaphanous; the discoidal spot narrow, brown, and margins all very narrowly bordered brown. Hind wing as fore wing, narrowly margined with brown, except on inner edge; tibia crimson. Expanse, 23 mm.

Hab. Fernandes Pinheiro, Parana, 2600 ft., April 12th, 1910 (E. D. Jones, W. J. Kaye).

Correbidia tristitia, n. sp.

Palpi with the first and second joints ochreous beneath, black above. Frons and collar ochreous, mixed with dull brownish black;

patagia ochreous near head, becoming dark brownish. Fore wing at base purplish black; a broad fascia and broad apical patch purplish black; a yellow basal and postmedian band, the latter widening greatly at tornus, and waved at vein three. Hind wing dull semi-transparent ochreous; a dark triangular patch extending inwards from costa, becoming very well-defined on outer edge; outer margin pale purplish black. Expanse, 33 mm.

Hab. Rockstone, British Guiana, April, 1901 (W. J. Kaye).

Pheia bisigna, n. sp.

Fore coxæ white. Thorax black; patagia with a large crimson spot. Abdomen with pairs of white patches on first and second segments; other segments black. Fore wing with a minute crimson point at base, a broad sharply cut-off black apical patch, and narrow costal and outer marginal black bands; discoidal spot narrow, black. Hind wing hyaline, the apex broadly and outer margin narrowly black. Under side of abdomen silvery white on first five segments. Expanse, 27 mm.

Hab. Potaro River, British Guiana, May, 1902 (C. B. Roberts).

Heliura fulvipicta, n. sp.

Fore wing narrow, elongated, brownish, with darker black-brown markings; a broad black-brown median fascia and broad apical patch; base blackish brown; nervures very dark; a bright yellow spot at base. Hind wing hyaline, with a very broad black margin. Head with two yellow spots behind the eyes. Thorax and patagia black-brown. Abdomen black, with a yellow basal spot. Under side of abdomen with two large white patches on third and fourth segments. Expanse, 35 mm.

Hab. Potaro River, British Guiana, June, 1903 (C. B. Roberts).

WHAT HAS BECOME OF THE BRITISH SATYRIDÆ?

By Prof. R. MELDOLA, D.Sc., F.R.S., F.E.S., &c.

AMONG the reminiscences of my early collecting days some forty odd years ago is the abundance of certain species of Satyrid butterflies in the London district in localities from which they have now disappeared altogether, or have become so scarce as to appear notable when observed. It is not altogether a case of "urbanization," because many of the districts frequented by me in my youth, such as Epping Forest, the chalk downs south of Croydon, &c., are still open spaces and more or less rural. Moreover, the species which I have in mind are generally less abundant all over the country than they used to be, so that some wider cause than the spread of cities must be sought for. It is noteworthy that the Satyridæ should apparently be so especially affected by adverse conditions. Let me, in the first

place, state the facts from my own memory. In the late sixties and early seventies *E. ianira* was abundant round and about Leyton, in Essex, and in the Epping Forest district generally. It swarmed among the long grass of the Hackney Marshes and all along the Lea Valley. It is now a comparative rarity in this district; two years ago a few specimens were noted, as a kind of curiosity, in the marshes between Ponders End and Chingford, but the predominance of this species is evidently a thing of the past. During the same period *P. egeria* used to sun itself on the southern wall regularly every summer in our garden at Leyton, and was fairly common in the Forest. I have not seen it in the latter district for more than twenty years. So also *P. megæra*, which could always be seen in the Forest glades, has practically disappeared from this locality. The same remark applies to *E. hyperanthes*, which used to flutter in swarms over the bushes in the Forest, and which is now quite extinct in the district, according to my experience. *E. tithonus* was never common in the Forest or its environment, but could always be seen at the right season. In the country round Twickenham and Anerley, which I also used to frequent at that time, this butterfly was quite a conspicuous feature of hedgerow insect life. I have seen the bramble-flowers crowded with this butterfly season after season, and, paraphrasing Hans Breitmann, I ask, "Where is that species now?" At the time referred to, the chalk downs along the Caterham Valley (Riddlesdown, &c.) used to be favourite localities with collectors. The commonest Satyrid then was *S. semele*, which was out with *L. corydon* (common), *L. minima* (rare), and *Z. filipendulæ* (abundant). One morning's visit to Riddlesdown at that period sufficed to fill up one's "series" of all these species. *Semele* has disappeared from the locality, so also, according to my experience, has *L. minima*. *L. corydon* and *Z. filipendulæ* still linger on in the more remote and less frequented coombs of the chalk downs, but they have disappeared from their former habitats, and are getting scarcer in their present localities.

The question raised in this note is, of course, only part of the general question of the causes of the fluctuation in numbers of British species. The answer cannot be given in terms of one factor: it is not always a simple case of the over-running of localities by "humanity," because I have found, and my experience is confirmed by others, that the decline of the Satyridæ is pretty general. The causes which in districts undergoing "urbanization" are operative to the extent of producing local extinction appear to be also operative, although in a lesser degree, in the rural habitats of those species which used formerly to be abundant. What these causes are I am not prepared to state dogmatically, but it seems to me worth while putting my recollections upon record before they fade, for there must be

many of my contemporaries whose experience of former times will coincide with mine. Other species and the representatives of other families have, as we all know, been observed to decline locally, but in no other case within my knowledge has such a general family decline been noticed as that which is made manifest in the Satyridæ by a comparison of the present state of affairs with that which existed forty years ago. It has been suggested, and with some reason, that the protection in modern times of small birds by Act of Parliament has some connection with the decline of certain British species of Lepidoptera. This may be the case, and, if so, the enemies of the Satyridæ must be sought for among those insectivorous birds which hunt among grasses for food, for the larvæ of this family are all grass feeders. To this suggested cause may be added the fact that the Satyridæ are not migratory, and that losses by increased persecution are not made good by occasional immigration from the Continent, as is the case with the Vanessidæ. It is also possible that improvements in agricultural practice have had something to do with the decline of some of the grass-feeding species, but this cause can hardly be assigned in the case of species which frequent woodlands and heaths. I may add, with reference to the latter, that even the commonest of the heath-frequenting species, *C. pamphilus*, is a rarity now in the districts referred to as compared with its abundance in former times.

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 111.)

♂ *Macrocilix taiwana*, sp. n.

♀. Head white, face brown; thorax and basal segment of abdomen white; rest of abdomen partly denuded, but appears to have been brown. Fore wings white with fuscous grey transverse markings; antemedial line double, wavy, angled near costa; postmedial band wavy, angled near costa, traversed by two white lines, and crossed by the white veins; a black mark in band near inner margin, and a curved tawny streak from end of cell almost to outer angle; submarginal band not extending to costa. Hind wings white, with two blackish dots about the middle of inner margin, and a black-brown cloud at anal angle; the fuscous grey postmedial band, which does not extend above vein four, is traversed by two wavy white lines. Fringes of all the wings greyish tipped with darker, preceded by black lunules. Under side whitish, with blackish macular lines on the outer area of all the wings; the basal half of the fore wings clouded with fuscous.

Expanse, 42-48 millim.

Collection number, 1225.

Two female specimens. One from Arizan (7300 ft.), August, 1908; the other from Rantaizan (7500 ft.), May, 1909.

Deroca arizana, sp. n.

♀. Wings hyaline, with traces of greyish transverse lines; some greyish clouds on the outer margin, marginal line greyish interrupted by the whitish veins.

Expanse, 30 millim.

Collection number, 1697.

One female specimen from Arizan (7500 ft.), June, 1908.

Oreta brunnea, sp. n.

♂. Head chocolate-brown; thorax brown, greyish tinted in front; abdomen brown inclining to reddish. Fore wings brown, flecked with greyish on basal area; a dusky antemedial shade; post-medial line dark brown, almost blackish, outwardly edged with greyish, and most distinct towards apex; it runs from just beyond middle of the inner margin to apex. Hind wings obscure reddish brown; indications of a dusky antemedial line, a few black dots on the outer margin near anal angle. Fringes of all the wings reddish. Under side orange-red, freckled with brownish; outer area of the fore wings washed with greyish.

Expanse, 41 millim.

Collection number, 1242.

One male specimen from Arizan (7300 ft.), August 24th, 1908.

Oreta purpureofascia, sp. n.

♂. Fore wings light brown, with reddish brown ante- and post-medial lines, the latter angled near costa; space between the lines purplish brown, and this colour extends along the inner margin to the base. Hind wings have the basal half purplish brown, limited by a reddish brown line, and the outer half light brown. Under side ochreous brown, sparingly freckled with blackish.

Expanse, 34 millim.

Collection number, 1244.

ab. *unicolor*, nov.

All the wings purplish brown, lines reddish brown as in the type.

Both type and aberration are from Kanshirei; the former was taken in May, 1907, and the latter in July, 1908.

Near *O. olga*, Swinhoe.

Aroa nigrofascia, sp. n.

Fore wings brown, clouded with blackish at the base, and along the costal area almost to apex; antemedial band blackish, nearly straight; a blackish reniform mark at end of the cell; postmedial line blackish, diffuse, wavy, excurved below costa; a series of blackish lunules on the outer margin, preceded by some blackish dots, near the costa and the inner margin; fringes faintly chequered

with blackish. Hind wings brown, suffused with blackish, chiefly on the costal and outer areas; fringes pale greyish brown. Under side brown, rather paler than above; on the fore wings the cell, inner end of space below, and submarginal series of spots, blackish; on the hind wings the discal and submarginal spots blackish.

Expanse, ♂ 34 millim., ♀ 38 millim.

Collection number, 667.

One example of each sex from Kanshirei (1000 ft.); the male captured in July, 1908, and the female in April of the same year.

Euproctis simplex, sp. n.

Antennæ ochreous, shaft whitish. Head and thorax pale ochreous, abdomen ochreous, greyish tinged on middle segments. Fore wings white, slightly tinged with pale ochreous at base; fringes silky.

Expanse, 23–26 millim.

Collection number, 742 b.

Two male specimens from Kanshirei (1000 ft.), May, 1908.

The abdomen of the smaller specimen is less ochreous.

Palimpsestes taiwana, sp. n.

♀. Fore wings greyish white, clouded with blackish at the base; antemedial band dark grey, margined by wavy black lines, and traversed by a third line similar to the other two; medial line black, double,肘ed above middle, angled before the inner margin, commencing in a black patch on the costa, marked with black on the veins; postmedial line, curved below costa, composed of black and white dots; a submarginal series of more or less triangular spots, inwardly edged with blackish, and outwardly by a black line running to apex; orbicular and reniform marks whitish, outlined in blackish; veins dotted with white, some white dots on the costa towards apex; marginal line black, wavy; fringes pale grey, marked with darker. Hind wings whitish, suffused with pale fuscous, traces of a pale post-medial band; fringes whitish.

Expanse, 46 millim.

ab. obsoleta, nov.

♀. Base of fore wings not clouded with blackish; only the costal half of antemedial band and the costal spot of medial line clearly defined; a series of dusky longitudinal bars before the post-medial line, the later more distinct.

Expanse, 44 millim.

Collection number, 1768.

Both specimens from Rantaizan (7500 ft.), where they were captured in May, 1909.

Polyploca ænea, sp. n.

♂. Head and collar brown; thorax brown, ochreous tinged; abdomen paler. Fore wings pale bronzy brown, suffused with darker, and rather glossy; a black dot near base; antemedial line black, double, slightly curved; medial line black but faint, double,

elbowed above middle, angled above inner margin where it is edged by a pale patch; postmedial line black, wavy, confluent with medial line on the inner margin; submarginal line pale, wavy, commencing in a pale spot, the lower edge of which is black; stigmata indistinct; veins marked with black; fringes pale. Hind wings pale brown, suffused with fuscous on outer area.

♀. Similar to the male, but the head and collar are not darker than the thorax.

Expanse, ♂ 40 millim., ♀ 38 millim.

Collection number, 1222.

One example of each sex from Kanshirei (1000 ft.); the male taken April 27th, 1908, and the female, May 29th of the same year.

Phragmataecia fusca, sp. n.

♀. Head, thorax, and fore wings smoky brown; hind wings pale brown, smoky tinged; abdomen pale brown, posterior edges of segments darker. Fringes pale brown. Under side of all wings smoky.

Expanse, 50–53 millim.

Collection number, 670*b*.

Two female specimens from Kanshirei (1000 ft.), April 27th, 1908.

Phragmataecia cinnamomea, sp. n.

Head and thorax velvety brown; abdomen pale brown, edges of segments fringed with darker. Fore wings pale cinnamon-brown, costa blackish to beyond middle; inner marginal area clouded with blackish; discoidal mark black, linear; blackish wavy streaks between the veins on the outer area; fringes marked with blackish at end of veins.

Expanse, 40 millim.

Collection number, 670.

One male specimen from Kanshirei (1000 ft.), April 27th, 1908.

Phragmataecia obscura, sp. n.

Head and thorax dark brown; abdomen pale brown, segments fringed with darker. Fore wings dark fuscous brown, sprinkled with blackish, especially on the inner marginal area; two blackish dots at end of cell, the upper faint. Hind wings and under side of all wings pale fuscous brown.

Expanse, ♂ 32 millim., ♀ 37 millim.

Collection number, 670*a*.

One example of each sex, both rather worn, from Kanshirei (1000 ft.), April 17th, 1908.

Susica formosana, sp. n.

♂. Glossy pale brown, thickly powdered with black scales, especially on basal two-thirds of the costal area; a slightly curved narrow band from the costa, about one-third from apex to the inner

margin near base, is of the ground colour, almost free of darker scales, but with traces of a darker line running through it; a clear streak of the ground colour, from the costal end of the band almost to inner angle, diffuse; a black dot at end of cell. Hind wings glossy pale brown, slightly suffused with fuscous; veins dotted with black on the outer area. Under side pale brown, sparsely freckled with darker on the costal area of all the wings; veins paler, glossy.

Expanse, 34 millim.

Collection number, 662*a*.

A male specimen from Kanshirei (1000 ft.), May 11th, 1907.

Allied to *S. pallida*, Walk.

(To be continued.)

BY THE WAY.

WE were once asked whether entomology was an "exact" science. We answered in the affirmative, with the mental substitution of "exacting" in the place of "exact," having recently done some re-creative (not recreative) work on American-described Hymenoptera. As a matter of fact, the present condition of entomology in Britain is about as definite and exact as Lewis Carroll's "slithy toves," when they "did gyre and gimble in the wabe." The "wabe" in which we—er—gyrate and grumble needs crystallizing, the extent of present knowledge of the neglected orders tabulating, with the publication of statistics showing in what direction research work, both systematic and economic, is most necessary, practically and pure-scientifically.

One is moved to some discontent, such as the above, by the only too true remark of the 'Daily Telegraph' on March 3rd last: "We have in England no Government entomologist, no entomological experiment station, no organization which does for the country as a whole what economical entomologists do in India, in our dominions and colonies, and in the United States. And at present there is no course of lectures or training in entomology as a special subject given in England"; and the 'Morning Post' of 24th ult. epitomises a Press notice, which we also received too late for our last issue, thus: "In order to further the work of the African Entomological Research Committee Mr. Andrew Carnegie has given a sum of £1000 a year for three years, to defray the cost of sending qualified men to study the practical applications of entomology in the United States." The fact of the matter is that we in Britain take our entomology as a mere hobby; we ride it with so selfish a rein that we never touch what does not catch our instable fancy, and

with so idle a spur that our spasmodic investigations are rarely more than *pour passer le temps*. We sincerely congratulate Mr. G. H. Grosvenor.

The rat-borne plague of the Ipswich vicinity, about which we heard so much last year (especially from Sir Edwin Ray Lankester, K.C.B., M.A., LL.D., F.R.S.), is at present lying *perdu*, and more or less strenuous efforts have been made locally—too locally to be effectual, we fear—to exterminate the carriers of the host-flea. Personally, we are inclined to consider the trouble a thing of the past; but Mr. R. C. Wroughton, late Inspector-General of Indian Forests, than whom no one is more competent to judge, tells us that the rats are likely to simply migrate inland and the scourge to again break out, possibly in the neighbourhood of Hertfordshire. Here, again, there is no home entomologist from whom to seek succour. The only account of the matter we have seen, in anything like permanent form, is contained in a brochure on 'The Death-dealing Insects and their Story,' a delightful little book by Dr. C. Conyers Morrell, of the Authors' Club, published by the H. A. W. Offices, Brazennose Street, Manchester, late last year.

During last month Mr. H. Maxwell-Lefroy, M.A., Imperial Entomologist, India, gave a course of lectures on Entomology at the Imperial College of Science and Technology, South Kensington. The course was opened on March 2nd, and continued twice weekly during the month. In conjunction with the lectures, which were free, a course of practical work was also available for students desiring to specialize in entomology. The average attendance at the lectures seems to have been about twenty, and a fair proportion of this number took the practical course, for which a small fee was charged. These lectures, with the class work, will be resumed in May and June next.

The Entomological Society of London proposes to hold a *Conversazione* in the Rooms of the Linnean Society, Burlington House, by kind permission of the President and Council of that Society, on Wednesday, May 17th, at 8 p.m. Lectures will be delivered during the evening, by Professor Poulton, F.R.S., F.L.S., &c., and Mr. F. Enock, F.L.S., F.E.S.

C. M.

NOTES AND OBSERVATIONS.

REMARKABLE ABERRATION OF *TERIAS ELATHEA*.—Those interested in the butterflies of the West Indies will be pleased to hear that when collecting here this morning, at an elevation of about 300 feet above sea-level, I had the good fortune to net a male specimen of *Terias elathea*, in which not only the black longitudinal dash on the

upper side of the fore wings is practically absent, but the broad black borders are also entirely replaced with yellow; only the very faintest grey outline, scarcely visible to the naked eye, indicates the inner margin, to where the black border would have extended. The hind wings of this beautiful specimen are entirely white, save only for a faint grey scalloped edging slightly increasing towards the anal angle, again indicating to where the black border was meant to have extended, had the specimen been a normal one. The under side is much the same as usual, only rather pale. I should be interested to know if others who have collected in this part of the world have ever met with this form of *T. elathea* before? — MARGARET E. FOUNTAINE, F.E.S.; Montego Bay, Jamaica, February 13th, 1911.

NOTE ON TROCHILIMUM APIFORME.—Lt.-Colonel Nurse in his article on the Sesiidæ, published in the March issue of the 'Entomologist,' questions Barrett's statement about the larvæ of *Trochilium apiforme*. I worked for this species last April in the Fens, where most of the black poplars are infected. I then found the insect in three stages: (1) half-grown larvæ low down in the roots; (2) full-grown larvæ in their pupating tunnels—these, when disturbed, withdraw into the tree and were not easy to get out; (3) cocoons, just under the bark. From this I gather that the larva stage probably lasts only two years, and that many of the larvæ certainly do not form their cocoons till April or May, though the majority seem to do so earlier. The few cocoons that I examined held either larvæ or freshly changed pupæ. My treatment of both larvæ and pupæ was not satisfactory; the former without exception died, while of the latter about fifty per cent. emerged late in June, the rest became mouldy. Probably I kept them too moist, for fear that the cocoons should contract and damage the pupæ. I should welcome a note from any correspondent on the best method of keeping Sesiidæ pupæ.—J. S. CARTER; Warren Hill, Eastbourne, March 5th, 1911.

THE ITALIAN FORMS OF ZYGÆNA TRANSALPINA, Esp.—In 'Bollettino del Laboratorio di Zoologia Generale e Agraria,' vol. iv. pp. 134–161, Conte Emilie Turati discusses the variation of *Zygæna transalpina* in Italy. Fifteen new forms are named, thus increasing the number of known forms to thirty-eight.

FOOD OF VANESSA ANTIOPA LARVÆ.—With reference to Mr. A. H. Jones's note in the 'Entomologist,' p. 112, on the larvæ of *V. antiopa* being in his experience essentially sallow feeders, it may interest him to know that in 1892 I reared about seventeen or eighteen hundred specimens of this fine butterfly from eggs deposited on willow by captive females, kindly sent me by Mr. Frederick Raine from Hyères, and that over one thousand were fed exclusively upon willow, but I found sallow appeared equally suitable for food, also birch was readily eaten, even when willow had formed the sole food until the last stage. They also fed well on elm; nettles, however, did not appear suitable as food, and was not touched by them during the last two or three stages; it was only when quite young that they could be induced to feed upon this plant, and although they fed for several days on nettles, they did not thrive, and eventually died. In some

localities I believe birch is usually the chief food of this species. As I have before stated, there is no authentic instance of either the eggs, larvæ, or pupæ of *V. antiopa* ever having been found in the British Islands. From the large size, velvety black colour, and gregarious habits of the larvæ, they would form a most conspicuous object on the foliage of any tree; it is obvious that if they existed in this country they could hardly have escaped detection.—F. W. FROHAWK; March, 1911.

AMPHIDASYS BETULARIA ab. DOUBLEDAYARIA IN ESSEX.—My experience certainly endorses that of Mr. Mathew, given on page 67 of this year's 'Entomologist,' as to the comparative frequency of the occurrence of *doubledayaria* in Essex. On June 9th, 1909, I bred a normal female from a larva obtained in my garden at Westcliff-on-Sea, on Michaelmas Daisy, the previous year. In the evening, I hung her up in a gauze cage to a lime tree in the garden, and, although it was a bad evening, she attracted three males. Of these, two were typical, and one ab. *doubledayaria*. In the autumn of the same year I took a number of larvæ off a climbing rose in the garden of the Rectory at Leigh-on-Sea. From these I bred fifteen moths during April and May, 1910, four being typical and eleven ab. *doubledayaria*. Of course, this is a very limited experience, but, as far as it goes, it tends to prove that in the Southend district ab. *doubledayaria* is about as common as the typical form.—ALFRED T. STIFF; Leigh-on-Sea, Essex, February 24th, 1911.

SPECIES NEW TO THE GLOUCESTERSHIRE LIST.—I find that I took on June 20th, 1906, amongst the apple trees in my garden, a specimen of *Argyresthia cornella* (*curvella*), and on August 6th following I found *Cataplectica* (*Asychna*) *profugella*—a local and uncommon species—on the Cotswolds. On June 23rd, 1910, *Argyresthia sorbiella* was found resting on a yew tree in the Forest of Dean. *Oxyptilus teucarii* appeared on our hills on July 14th following, at dusk, amongst *Teucrium scorodonium*, and *Ephestia kuhniella* was captured in my house on August 26th and September 21st last. These species do not appear to have been hitherto recorded from this county. I am again indebted to Mr. Meyrick for his kindness in identifying the specimens.—C. GRANVILLE CLUTTERBUCK, F.E.S.; Heathside, Heathville Road, Gloucester, February 22nd, 1911.

WANTED: LIVING VANESSA POLYCHLOROS.—Should any collector capture a female *Vanessa polychloros* this spring and would kindly send it *alive* direct to me, I should be greatly obliged and would make a return. I am particularly anxious to obtain eggs of this species.—F. W. FROHAWK; Rayleigh, Essex.

SIX DAYS AT GLEN TILT, PERTHSHIRE.—It is a long time since I have seen any notes in the 'Entomologist' on the Lepidoptera of the above district, or on collecting therein, so having spent six days there in July last, 19th to 24th inclusive, I thought I would send you a brief note of the species observed:—

Erebia aethiops. Plentiful whenever a gleam of sunshine appeared, occurs over a great extent of the Glen in grassy places.—*Boarmia repandata*. Several on trunks of fir trees, a greyish form and some-

what smaller than the south of England type.—*Larentia cæsiata*. Abundant both in the Glen, and on rocks on the mountains.—*L. ruficinctata*. Two only on one rock, no doubt abundant if one could have found its headquarters, but having taken a good series at Rannoch in August, 1891, on the rocks at the foot of Schiehallion, I did not specially work for it.—*L. didymata*. Common, as usual. I have always found this insect plentiful wherever I have collected in Scotland.—*L. olivata*. A few on rocks in the Glen.—*Dasydia obfuscaria*. On rocks at foot of mountain, not common.—*Emmelesia minorata* (*ericetata*). Plentiful, occurring in the Glen, and also on rocks on the mountains.—*E. adæquata* (*blandiata*). Plentiful on a fence in one place, also beaten from fir trees; this insect was nearly over.—*Coremia munitata*. Plentiful in places at the foot of the mountains. I could not find this species on the rocks, but after a time obtained them by beating the large tufts of heather that grow on and hang over the sides of the burns; the moths conceal themselves under these during the day.—*Coremia designata* (*propugnata*) and *Cidaria populata*. A few of each taken.—*Scoparia murana*. A few amongst rocks and heather.—*Crambus myellus*. Three only. To take this insect was one of the chief objects in my visiting Glen Tilt. I was very pleased to obtain it, and I think the weather was solely the cause of my not meeting with a larger number, but as it rained more or less for five days out of the six I spent in the locality, it was almost impossible to work for *myellus*, the fir trees which they mostly frequent being saturated with moisture to such an extent that a shower bath descended upon you on your attempting to use the beating stick.

The almost total absence of sunshine and the drenched condition of all the herbage and undergrowth made it almost impossible to work for Tortrices or Tineæ, but I was fortunate to meet with *Aphelia argentana* on the day I arrived. The rains set in the next day. I found them plentiful amongst long grass in various places extending some two miles or more up the Glen. *Argentana* is much like *Crambus perlellus* when on the wing, being about the same size and colour, and it also flies amongst grass like the *Crambus*. I passed over several before finally realising what they were, and that I had found one of our most local Tortrices. Other Tortrices noticed were *Aphelia osseana*, just coming out, *Mixodia palustrana*, plentiful during a momentary gleam of sunshine, flying over heather, also one or two *Coccyx ustomaculana*. Amongst the Tineæ were observed *Argyresthia conjugella*, *A. gædartella*, *A. brochella*, *Ecophora stipella*, *Gelechia galbanella*, *Gracilaria syringella*, *Depressaria pulcherrimella*, and *Brachycrossata cinerella*. I did no night work, the weather making it impossible; I have therefore no record for the Noctuæ. Glen Tilt is a beautiful spot, and the scenery all round it and Blair Athol is superb; this coupled with the delightful and invigorating air of the mountains gives a zest to collecting most enjoyable to one like myself whose entomological work has been necessarily chiefly confined to the southern counties. I hope, however, to be able to make a lengthened visit to the Highlands, including Glen Tilt again, in the coming summer, and can strongly recommend any of your readers who are field workers, and would prefer to take the Highland Lepi-

doptera themselves, rather than obtain them by purchase or exchange, to do the same. I may perhaps as well say, to mitigate the effect of my observations as to the weather met with in Glen Tilt, that it does not always rain in the Highlands. I have had three holidays there and two out of the three were fine.—G. H. CONQUEST; 10, Meteor Road, Westcliff-on-Sea.

OPTICAL INSTRUMENTS.—We have recently received two catalogues from E. Leitz, optical instrument makers, of Wetzlar, London, &c., those dealing with "Photomicrographic Apparatus," and "Projection Apparatus and Drawing Appliances involving the Principle of Projection." These catalogues are two out of nine. The name of Leitz is now, of course, well known as that of a firm of first-class optical instrument makers, and anyone in need of a microscope, projection apparatus, photomicrographic apparatus, or anything connected with such things, should call at 9, Oxford Street, or examine the catalogues. These latter are really more than simply price lists, as they contain excellent illustrations of many of the instruments, and form something of a text-book in connection with them. As regards photomicrographic apparatus (Catalogue 43 G), we like very much the vertical method of working with camera and microscope, and some of the instruments figured seem very compact and convenient. There are at the end of the catalogue two plates of photomicrographs which every photographer seeing them will like to possess, the clearness of detail being particularly fine. Another publication of this firm is a fully illustrated pamphlet of forty-two pages on "The Microscope and Some Hints on How to Use it," which is excellent, though not intended quite for the beginner in microscope-work, with the exception of the general hints at the end. The firm offer the use of electro-illustrations to authors.—W. J. LUCAS.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Annual Meeting, January 26th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Report of the Council was adopted. It was stated that the membership stood at one hundred and sixty-four, and that the average attendance at the twenty-three meetings was thirty-three. The volume of 'Proceedings' published consisted of one hundred and fifty pages, with thirteen plates, and was the most attractive that the Society had produced.—The following is a list of the members elected to fill the offices of the Society for the ensuing year:—President, W. J. Kaye, F.E.S.; Vice-Presidents, A. Sich, F.E.S., and A. E. Tonge, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., F.E.S. (Corres.), and Hy. J. Turner, F.E.S. (Report.); Council, R. Adkin, F.E.S., F. W. Cowham, E. C. Joy, F.E.S., R. A. R. Priske, F.E.S., A. Russell, F.E.S., B. H. Smith, B.A., E. Step, F.L.S. The President then read his Address. After dealing with the affairs of the Society and making suitable references to those who had passed away during the year, particularly to the irreparable loss, not only the Society, but the

entomological world, had incurred by the death of a past president, Mr. J. W. Tutt, he proceeded to the subject of his Address, "Neuration in its Bearings on the Classification of Lepidoptera." Votes of thanks were then passed to the retiring Officers and Council.—Mr. Turner, on behalf of Mr. Murray, of St. Anne's-on-Sea, exhibited a series of *Luperina gueneei* taken at the above place, including the typical form, the var. *baxteri*, and two new and very distinct forms, one of them with a very pale, almost white submarginal band, which he was naming var. *murrayi*, and of the other several very dark specimens, which he was naming var. *fusca*. Both worn specimens, and others in almost bred condition, were shown.—Mr. Newman, autumn bred specimens of *Polygonia c-album*, var. *hutchinsoni*, a form of the species hitherto only obtained in the summer brood; they were from the same female as the yellow forms previously exhibited.

February 9th, 1911.—Mr. W. J. Kaye, President, in the chair.—Mr. Wakeley, of Wimbledon Common, was elected a member.—Mr. Newman exhibited shoots of birch, taken from the base of stumps of cut trees, from which the larvæ of *Egeria culiciformis* had been extracted by birds. It was stated that at times the larvæ bore into the twigs instead of into the stumps.—Mr. Hugh Main, twigs of aspen swollen with galls caused by the larvæ of the Longicorn beetle, *Saperda populnea*.—Mr. Ashby, a series of *Lasioderma serricorne*, which was found swarming in a house in Thames Street.—Mr. W. J. Kaye, on behalf of Mr. Jupp, varieties of *Ennomos angularia*, with the two transverse lines filled in with a dark fascia, *Boarmia repandata* var. *conversaria*, with an unusually heavy black central fascia, and *Triphaena fimbria*, with very strongly contrasted black and white markings on the fore wings.—Capt. Cardew, a number of species which had flown into light in a house on the Island of Dominica, W. Indies, including four Sphingid species—*Pachyla ficus*, *Pholus vitis*, *P. labruscæ*, *Herse cingulata*; also *Deiopeia ornatrix*, *Ecpantheria icasia*, and the Syntomids, *Argadea apta*, and *Cosmosoma demantia*, &c.—The rest of the evening was devoted to the exhibition of microscopic slides by Messrs. West (Ashted), Fremlin, Edwards, and R. Adkin.—HY. J. TURNER, *Hon. Rep. Secretary*.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—January 3rd, 1911.—Exhibits:—*Abraxas grossulariata* ab.: Mr. G. Brooks, a specimen with usual yellow markings obsolete, but ground colour of all wings deep yellow. *Epinephele ianira* ab.: Mr. C. N. Collenette, all wings bleached and usual fulvous patches and ocelli only faintly indicated; Salcombe, 1908. *Sesia sphegiformis*: Mr. G. H. Conquest, a number of males taken at Brentwood, June, 1895, by assembling with bred females. *Melanic Melitæa aurinia*: Mr. F. B. Cross, example with basal three-fourths of superiors almost entirely black; Cumberland. *Leucania l-album*: Mr. H. M. Edelsten, an imago, bred, 1910. *Argynnis selene*, local variation in size: Mr. A. F. Hemming, comparative series from Princethorpe (Warwick) and Ashdown (Surrey); measurements showed that the largest and smallest male and largest and smallest female from the former district were 8 mm., 3 mm., 7 mm. and 2 mm., wider respectively in wing expanse than corresponding specimens from the latter locality. *Melitæa aurinia*, wide

local variation: Dr. G. G. C. Hodgson, a series selected from over one hundred specimens bred, 1910, from Wiltshire larvæ; there was a marked melanic tendency in some cases, while in others the black marginal markings approached obsolescence. Some examples approximated to var. *præclara*, and others showed almost unbroken fulvous coloration. *Trichura crategi* abs.: Mr. L. W. Newman, dark forms from Selkirk, and pale forms from Lincoln. *Gnophos obscurata*: Mr. L. B. Prout, a variable series, Folkestone, August, 1910; some males nearly white, some females blackish, many with two black lines very pronounced, and a good proportion of the banded ab. *fasciata* (Prout). *Vanessa io* var. *cyanosticta* (Raynor): Mr. V. E. Shaw, three examples of this var. bred August, 1910, from Darenth Wood larvæ; also an asymmetrical *Zygæna filipendulæ* with spots confluent on left wing only; Dover, August, 1910. *Vanessa antiopa*: Mr. P. H. Tautz, a specimen taken at Oakham (Rutland), October 20th, 1910, inside a shop window, by Mr. A. Hassan. Melanic *Cænobia rufa*: Mr. R. G. Todd, two very dark specimens, said to be not referable to ab. *fusca* and therefore apparently a new variety. *Pieris napi*, female ab.: Mr. H. B. Williams, a specimen with black bar on under side fore wings, faintly indicated on upper side, and connecting up the two black blotches thereon.

January 17th.—*Senta maritima* vars.: Mr. C. E. Capper, a series from Isle of Wight, including vars. *bipunctata*, *nigro-striata*, *wismaniensis*, and *combinata*. *Dianthœcias*: Mr. F. B. Cross, a bred series of *D. conspersa*, North Cornwall, including very dark example, almost unicolorous save for pale marginal line. Mr. H. M. Edelsten, a very variable series of *D. carpophaga* bred from Sussex pupæ, the emergence extending from end of May to mid-August; the specimens ranged from strongly marked dark forms to almost white with only the stigmata faintly indicated. *Argynnis paphia* abs.: Mrs. C. Hemming, specimens bred, 1909 and 1910, from New Forest parents, showing exaggeration of black markings; also var. *valezina*, with increase of black markings and general melanic suffusion. *Hesperia linea*: Mr. A. F. Hemming, a series showing two different forms occurring together in a Sussex locality, the one with light ground colour and narrow border, and the other with dark ground colour and broad border. *Tæniocampa pulverulenta* var. *haggertii*: Mr. J. Morris, an example of this somewhat rare ab. taken near Godalming.—SIDNEY J. BELL, *Hon. Secretary*.

RECENT LITERATURE.

The Rhopalocera of Java: Hesperidæ. By M. C. PIEPERS & P. C. T. SNELLEN. With the collaboration of H. FRUHSTORFER. Royal 4to. Pp. i.-xxvi. and 1-60. Plates, 6 coloured. The Hague: Martinus Nijhoff. 1910.

THE Introduction (pp. i.-xxvi) is largely biological, the subject of colour-evolution is discussed at some length, and reasons are given for treating the Hesperidæ as "not so far differentiated from the Heterocera as the other Rhopalocera, and therefore in some respects they still stand between these two groups."

The systematic arrangement of the family is pretty much that of Mabille ('Genera Insectorum,' 1903).

So far as is known, ninety-five species of Hesperidæ are found in Java, but upwards of twenty others have been recorded from the island. The latter, however, are considered doubtful, for as we are informed in the Introduction—"not a few butterflies in European collections are said to originate from Java, though in reality they are not from that island, but have been gathered from other islands in the Indian Archipelago and only transported *via* Java to Europe."

Both sexes are shown in thirty of the seventy-eight species figured, and one or more of the early stages of a good proportion are also depicted in colour. Of eleven other species, the imagines of which are not drawn, there is a figure of the larva of each, and in the case of two of them, the pupa also is shown.

Where known the larvæ are described, and their habits and food-plants noted. The distribution of the species in Java is also indicated. No new species is here described, but several of Moore's species that had been degraded by previous authors have been reinstated. The only local form that is specially mentioned is referred to as follows:—"Among the specimens of the type *Acerbas anthea* described by Hewitson and figured by Distant according to a male from Malacca, the white band does not continue up to the external margin as it does with the Javanese specimens, for which reason the latter can be distinguished as *forma Javanica*."

Diptera Danica. Genera and Species of Flies hitherto found in Denmark. By WILLIAM LUNDBECK. Part iii. Empididæ. Pp. 324. 141 figures in the text. Copenhagen: G. E. C. Gad. London: William Wesley & Son. 1910.

ONE HUNDRED AND SEVENTY species of Danish Empididæ are here described and assigned to five subfamilies in the following sequence:—1. Hybotinæ (3 genera, 9 species). 2. Empidinæ (3 genera, 78 species). 3. Ocydromiinae (6 genera, 13 species). 4. Hemerodromiinae (7 genera, 18 species). 5. Tachydromiinae (8 genera, 52 species). A few other doubtful species are incidentally referred to. *Bicellaria*, Macq. supersedes *Cyrtoma*, Meig. for *nigra*, Meig., *spuria*, Fall., *melæna*, Hal., &c. *Geniculata*, Zett. is referred, as a variety, to *Rhamphomyia plumipes*, Fall. *Ocydromia ruficollis*, Meig. is the female of *Leptopeza flavipes*, Meig., whilst *ruficollis* Macq. is referred to *Ocydromia glabricula*, Fall. *Dolichocephala*, Macq. is adopted for *irrorata*, Fall., and *guttata*, Hal.; *melanocephala*, Fabr. is referred to *Chelipoda*, Macq.; and *vocatoria*, Fall. with *albiseta*, Zett. come under *Phyllodromia* Zett.; *dissimilis*, Fall. is removed from *Tachydromia*, Meig. to *Symballophthalmus*, Beck. Our author is of opinion that *nervosa*, Loew is specifically identical with *Drapetis aterrima*, Curtis. The twenty-nine species of *Empis*, L. are arranged in seven groups or subgenera, thus:—*Xanthempis*, Bezzi (6 sp.), *Anacrostichus*, Bezzi (1 sp.), *Pachymeria*, Stephens (1 sp.), *Lissemphis*, Bezzi (1 sp.), *Coptophlebia*, Bezzi (3 sp.), *Pterempis*, Bezzi (11 sp.), *Empis*, S. Str. (6 sp.).

Part i. of 'Diptera Danica' was published in 1907, and Part ii. in 1908.

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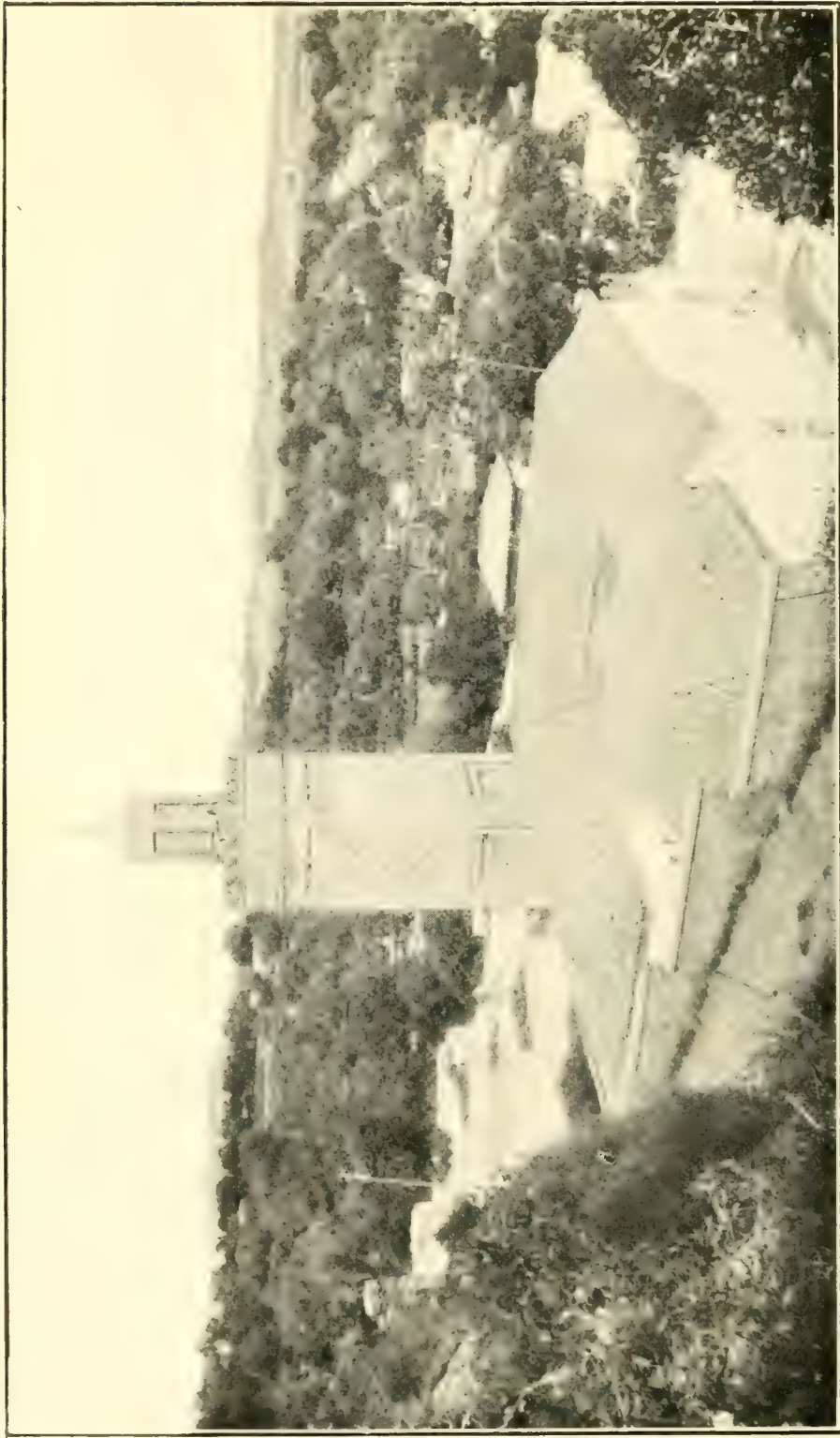
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Mosque of Sidi-el-Haloui in foreground.

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[No. 576

A NEW SPECIES OF PIMPLINÆ.

By CLAUDE MORLEY, F.Z.S., F.E.S.

IN May, 1908, Mr. G. T. Lyle noticed that many aborted flower-heads of gorse near Brockenhurst, in the New Forest, contained larvæ, and from these he bred the Cecidomyiid, *Aspondylia ulicis*, Trail, together with several Chalcid parasites. During the following September the seeds of the gorse were much galled, and he collected a good many affected pods, breeding from them the same Cecidomyiid and two species of Chalcididæ. On September 20th two Ichneumonids emerged from the galled seed-pods, and some three or four hours after emergence were seen to be *in cop*. During 1909 Mr. Lyle failed in attempts to breed more of this Ichneumonid, but in the autumn of 1910 he was rewarded by the presence of five males and one female of the same species from the pods. He has been so good as to allow me to examine these, and, since they have certainly not been previously brought forward, I propose to call them

Pimpla ulicicida, sp. nov.

Head black, with only the palpi pale; mandibles slender, with teeth of equal length. Antennæ slender, filiform, and hardly longer than half body. Thorax nitidulous, and finely punctate throughout, with notauli short but deeply impressed; mesonotum entirely or broadly at sides and base, mesopleuræ and sternum more or less broadly, and metapleuræ always, with metanotum often, bright red; tegulæ and a circular callosity beneath them stramineous; metanotum longitudinally bicarinate, with no discal areæ, and the petiolar very short; spiracles quite circular and not very small. Scutellum and postscutellum always entirely red. Abdomen linear, strongly punctate and white-pilose, with the tubercles obsolete as in *Scambus*; entirely black above, with the segments longer than broad, and becoming quadrate at fourth in female and sixth in male; basal segment parallel-sided, of male twice and of female but very slightly longer than broad, punctate throughout, male with discally parallel carinæ extending nearly to its apex; terebra exactly as long as abdomen. Anterior legs stramineous, with only the onychii infuscate; front

femora not emarginate beneath; hind coxæ and femora fulvous, with apices of former whitish, and the trochanters subinfusate; hind tibiæ dull white, infusate at both base and apex, and subincrassate before the former; apical hind tarsal joint at most thrice longer than penultimate; claws of female basally lobate. Areolet small, sessile, and strongly transverse; stigma pale piceous or luteous; nervellus subgeniculate, though but obsoletely intercepted, a third below its centre. Length, 4-6 mm. ♂, ♀.

The elongate segments and rufescent thorax lend this species much the facies of *Ephialtes*, to which genus I was at first inclined to refer it; it is, however, a true *Pimpla* of the *Epiurus* group, and very distinct among our indigenous species, where it should stand between *P. pomorum*, Ratz., and *P. gallicola*, Morl. I have been at some pains to place it in the palæarctic fauna, and find its closest allies to be the black *P. vesicaria*, Ratz. (Ichn. d. Forst. i. 115), and the pale-faced *P. pictifrons*, Thoms. (Opusc. Ent. viii. 757); but it appears to most closely approach the Mallorcan *P. erythronota*, Kriech. (An. Soc. Espan. Nat. Hist. 1894, p. 248), a larger and stouter insect with the abdomen much less cylindrical.

Mr. Lyle has been so good as to present me with the type of both sexes.

Pimpla has very rarely been raised from Diptera, and I am aware of but two instances of the kind: Rondani once bred in Italy what he called *P. alternans* from *Asphondylia genistæ*, Lw., and I have quoted at some length (Ichn. Brit. iii. 88) Giraud's observations on *P. detrita*, bred from the galls of *Ochtiphila polystigma*, Mg., on *Triticum repens* in Austria.

[With reference to the two species of Chalcididæ mentioned in the foregoing note, M. l'Abbé Kieffer has most kindly identified one as *Eurytoma dentata*; the other is a species of *Pteromalus*. I have not yet been able to clear up the question as to whether they are direct parasites of the Cecidomyid, or hyperparasites through the Ichneumonid. The fact that several of the Eurytomini are known to be either partly or entirely vegetable-feeders must also be taken into consideration.

G. T. LYLE.]

A BIOLOGICAL INQUIRY INTO THE NATURE OF MELANISM IN *AMPHIDASYS BETULARIA*, LINN.

BY S. H. LEIGH.

MELANISM in British moths is a subject that has given rise to much discussion and speculation in several entomological and other journals, but notwithstanding this we really know very little of the causes which operate in the production of melanic

forms. It is well known to entomologists that dark varieties of several species of moths have recently become increasingly common in many localities within the British Isles, and also that the dark forms are appearing in fresh localities.

It is very desirable and important to know whether the colour of these dark races of moths is protective, or whether it has some other significance. The "protective" theory certainly appears to be a very feasible one, for many of the moths have become darker in manufacturing districts where the trees and other natural objects upon which they rest have assumed a blackened aspect due to the increase of smoke. On the other hand, I do not think we can press the theory of "protection" too closely at present, for there are many well-known cases in which dark varieties of moths are found in localities far removed from the influence of smoke and where they most probably rest upon light-coloured objects. For example, in North Lancashire (at Silverdale and Grange) the black (*doubledayaria*) form of *Amphidasys betularia* is predominant where formerly it was very rare or absent, and where the atmosphere is as free from smoke and the natural objects (trees, stones, &c.) as clean now as at any previous time. There is probably some other factor than protective coloration at work in the production of this melanic form.

There are also instances in which dark varieties have been developed in moths that rest low down in herbage during the day. In these cases surely the colour could not be of protective value, because the moths are obscured in the grass, and the type of colouring would not matter so far as protection is concerned.

It is of course quite probable that the dark colour of many species of moths is protective, while in others it may be of physiological importance, and associated in some way with constitutional hardiness.

Before, however, any definite explanation of these phenomena can be attempted, it is necessary to have as correct a knowledge as possible of all the conditions which are likely to have any influence on the species known to exhibit this melanic change. Before we can decide whether the colour is protective or otherwise, it is necessary to know the precise nature of the "struggle for existence" of the moths in question.

To gain, however, an adequate knowledge of the circumstances that are likely in any way to affect the moths entails much work of a very laborious nature. I have already commenced such an investigation, and hope to continue it during the next few years.

I only desire now to bring forward one point in connection with my inquiry; this concerns the resting habits of the moths which are subject to this melanic variation. For instance, it is important to know whether the light-coloured moths (*i.e.* the peppered form of *A. betularia*) generally rest during the day on

lichen-covered trunks of trees or any other light-coloured object, and also whether the dark insects (as the form *doubledayaria* of *A. betularia*) select black tree-trunks on which to rest. If it can be shown that in the majority of cases the dark-coloured varieties *do* rest upon dark-coloured objects, and lighter varieties upon lighter objects, and also that the insects have many natural enemies, we might justly conclude that the colour has a protective significance. Information of this nature can, however, only be obtained by the co-operation of very many entomologists, for the chance of obtaining sufficient evidence from the observations of one or two persons is very remote. I should, therefore, be extremely grateful if entomologists would assist me in collecting information regarding the resting habits of any of the under-mentioned species belonging to the Geometræ which may have come under their notice.

Although the investigation which I am making is really on the melanism of *A. betularia*, the chances of obtaining sufficient records about the resting-habits of this species alone would be so small that I have included several other well-known melanic species in the list, in the hope that each entomologist may be able to make at least one record about one of the species in the list from his own observations. Particulars, which may be returned according to the subjoined scheme, are requested concerning the following species:—*Amphidasys betularia* (Peppered Moth), *A. prodromaria* (Oak Beauty), *Odontopera bidentata* (Scalloped Hazel), *Phigalia pilosaria* (Pale Brindled Beauty), *Boarmia repandata* (Mottled Beauty), *B. abietaria* (Satin Carpet), *B. rhomboidaria* (Willow Beauty), *Gnophos obscuraria* (Annulet), *Hybernia progemma* (Dotted Border).

Scheme of particulars:—

(1) State, if possible, the number of specimens of each variety (light or dark, &c.) of the above species that have been observed at rest, together with particulars as to the object upon which they were found; and also say whether they were conspicuous or well protected by their colour.

(2) State, if possible, whether the species is abundant, fairly common or rare in the locality to which reference of the observation is made.

(3) If it is not possible to answer the above questions, any other information concerning observations of a general character will be very acceptable.

Confirmatory evidence is of great value, and I should be very glad to receive records made independently by different persons for the same locality.

All help received will be fully acknowledged on publication, and I would like here to express (as it has not been possible to publish anything upon the subject) my great indebtedness to those entomologists who have previously sent valuable informa-

tion concerning the distribution, &c., of the various forms of *A. betularia* in their own particular districts in compliance with a former request.

It is hoped that the result of the investigation—which is partly statistical and partly experimental—may be to throw some light on the cause of the remarkable change in colour that has been observed in many British moths during the last sixty years.

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ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

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(Continued from p. 125.)

GANGLBAUER remarks that this type seems to be a most extreme modification from the original type, owing to the hook-like connections of the media and radius with their branches. But he points out that in many Nitidulidæ the recurrent branch of the media is very short, and in the Passalidæ and many Rhynchophora completely atrophied, so that, when the transverse veins in the cubito-anal system are at the same time wanting, the venation is very like that of the second type. We need not, therefore, he says, derive the second type from the third. On the contrary, he maintains that the second type is derived directly from the Adephagan type, a point in which Kolbe agrees with him.

It is a point, however, on which Lameere takes a different view, leading to a marked difference in his classification; for he believes that the Staphylinoidan type of wing-venation must have been derived from the Cantharoidean, and not directly from the Adephagan type; that, in consequence, the Staphylinoida must have branched off from the common Polyphagan stem at a later stage than the Cantharoidea, and should therefore come after them in the classification. But the decision of this question does not rest solely on the wing-venation. Other characters have to be considered; and, in support of their view, Ganglbauer and Kolbe are able to point to the strong resemblance between the primitive Staphylinoidan genus *Pteroloma* and certain Carabidæ, as well as to the great similarity between the larvæ of the two groups. In Lameere's opinion these resemblances are due to convergence. Ganglbauer's view that the third type represents the widest modification from the

original type seems to me to be also open to question ; for I do not regard the wing-venation of the Cupedidæ as the original type, though doubtless nearer to it than is any other, yet met with in the Coleoptera. It appears to want one longitudinal vein that is frequently to be seen in the cubito-anal system of the Malacoderms and Elateridæ, and while this may not be evident from the figures given by Ganglbauer, I suspect the reason is that he has not quite correctly homologized the veins. The vein A_1 of his Cantharoidean type corresponds, I think, with the Cu_2 and not with the A_1 of his Cupedid wing. Compared as a whole, the cubito-anal system in the Cupedidæ resembles more the same system in the more primitive Polyphaga than it does that of the Adephaga ; and the modification undergone by the Cantharoidean type seems to be limited to the loss of a few transverse veins, including one of the two between the media and its branch M_1 , the partial atrophy of M_1 , and a change from a straight to a curved form in the vein left to connect it with the media. Such a change would be no greater than that which can, I think, be traced in the transverse veins between A_1 and Cu_2 , in passing from the straight form they show in the Malacoderms to the more or less strongly curved form, enclosing an elliptical cell, which may be seen in some of the slightly higher groups.

It was never, in my opinion, justifiable to place the Cupedidæ in the Adephaga solely on the ground of their wing-venation. Kolbe, to whom we owe the discovery of the interesting wing-venation of this family, was the first to do so ; but he has since, on other grounds, withdrawn them, and now places the Cupedidæ in the Polyphaga. Here, again, I think he is wrong ; for, as I have recently pointed out,* the Cupedidæ possess, in common with most of the Adephaga, another character, which seems to be very distinctive of that group—namely, the presence of a distinct suture on each side of the prothorax, between the notum and the pleuræ. This character is to be found in all families of the Adephaga, including the Rhysodidæ and Paussidæ, although it shows in the latter a tendency to disappear in the more modified forms. It is said to occur also in some genera of Polyphaga ; but I have, so far, been unable to find anything in the nature of a true suture in any of those genera. Something of the kind may occasionally be seen, as, for example, in the Pythid genus *Crymodes*, but in these cases it is evidently only an impressed line of a secondary character.

A knowledge of the life-history of the Cupedidæ, which is at present wanting, would greatly contribute towards a more settled conclusion in regard to the systematic position of the family. From what little is known of the habits of these beetles, Lameere

* Ann. Mag. N. H. (8) v. p. 57 (1910).

believes that the larvæ live in wood, and are of the cruciform type; but this remains to be proved. He considers the Cupedidæ to be Adephaga of the most primitive type.

The Sexual Organs—Ovaries and Testes.—The ovaries of insects consist each of a greater or lesser number of tubes, which taper off to a thread at one end, and at the other open into the oviduct. Each ovarian tube contains eggs or cells that develop into eggs, and it generally contains also other cells which do not develop into eggs, but whose function it is to supply nutriment to the growing egg-cells. According to the presence or not of these nutritive cells, and their position when present, the ovarian tubes offer three different types of structure, placed by Korschelt and Heider in the following order:—(1) Without nutritive chamber. (2) The nutritive cells in chambers which alternate with the egg-chambers (*meroistic ovary*). (3) The nutritive cells massed together in the single terminal chamber (*holoistic ovary*).

The first type is not met with in the Coleoptera. The second occurs in the Coleoptera, but only in those families now comprised in the Adephaga. In all other Coleoptera, so far as is known, the ovaries are of the third type. Emery, who first used this difference in the structure of the ovaries as a basis for dividing the Coleoptera into two suborders, the Adephaga and Polyphaga, considered that the Polyphagan type of ovary was the more primitive of the two. From the order in which the types are placed by Korschelt and Heider, these distinguished embryologists seem to suggest the opposite view—which is also the one accepted by Ganglbauer, Kolbe, and Lameere.

The structure of the testes was investigated by Leon Dufour in a great many different kinds of beetles more than seventy years ago; but his work seems to have received less attention from systematists than the results deserved, although these had been well summarized by Lacordaire in his ‘Introduction à l’Entomologie.’ These organs (the testes) can, says Lacordaire, be divided at once into (1) those which are simple, and (2) those which are compound. The simple testes consist each of an elongated slender vessel, usually coiled up to resemble a ball; they are found only in the two families “des Carabiques et des Hydrocanthaires,” that is to say, in the Adephaga (Fig. 5).

The compound testes are formed of two or several glands—the “capsules spermatiques,” or testicular follicles. They are divisible (in beetles) into three sections, according to the form of the follicles and the manner in which these join the *vas deferens*. The first and second sections differ little from one another, and present intermediate stages; the follicles are more or less elongate, tubular, or in the form of rounded, oval or pyriform sacs, but always sessile, *i. e.* without a special duct leading from each follicle. In the first section they are placed at the end

of the *vas deferens*, in the second around a more or less considerable portion of its length; they occur in Cleridæ, Heteromera, Coccinellidæ, Hydrophilidæ, Staphylinidæ, and Silphidæ (Fig. 6).

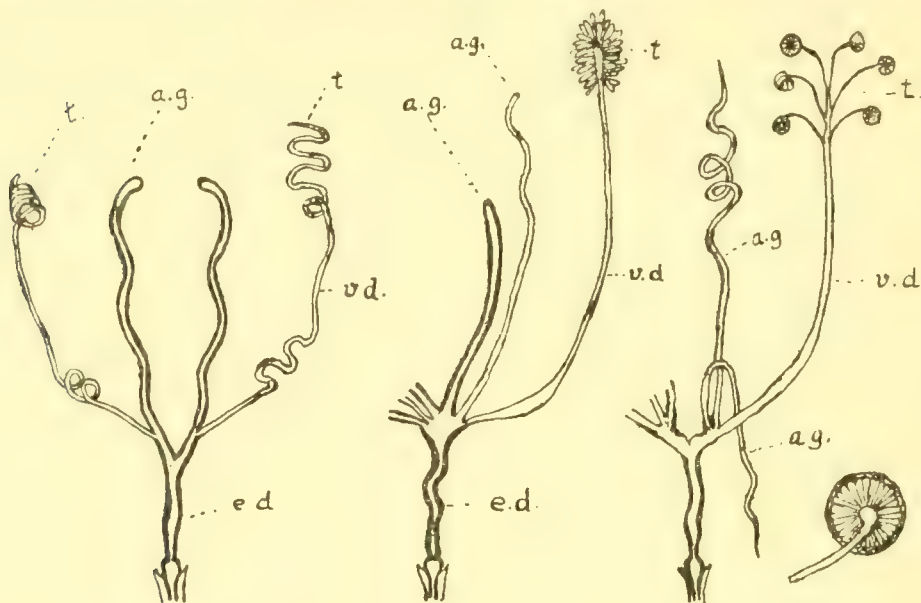


Fig. 5.

Fig. 6.

Fig. 7.

Three types of male sexual organs in Coleoptera (represented diagrammatically). *t.*, testis; *v. d.*, *vas deferens*; *e. d.*, ejaculatory duct; *a. g.*, accessory gland.

In the third section, the testes are composed of rounded, more or less depressed capsules, having each its own separate duct or pedicel, and abutting, sometimes at the same point, sometimes at different points, upon the *vas deferens*. Testes of this kind, which Lacordaire considered to be those of the most perfect organization, are met with only in the Longicorns, Chrysomelidæ, Rhynchophora, and Lamellicorns.

Dr. Bordas, who has recently carried out similar investigations on a more extended scale, has arrived at practically the same results. He divides the testes into (1) simple and (2) compound; and of the latter he makes two subdivisions, according as the seminal glands are (1) "fasciculées," and (2) "disposées en grappes."

Simple tubular testes, which he considers to be the more primitive type, are characteristic of the Adephaga, and confined to that group. In all other beetles that he examined the testes were compound.

The compound testes of his first subdivision correspond with those of Lacordaire's third section. The glands, from two to twelve in number, of which each organ is composed, are not simple follicles like those of the other subdivision, but consist each of a number of ampullæ arranged radially within a common covering and opening into a central receptacle formed by the dilated end of the duct that leads to the *vas deferens*. Organs of this type, represented diagrammatically in Fig. 7, were met with

in all but two of the genera * examined belonging to the groups Longicornia, Phytophaga, Rhynchophora, and Lamellicornia, and only in genera belonging to those groups.

The fact that testes of the simple type characterize the Adephaga, while compound testes are found in all other beetles, confirms again the division of the Coleoptera into two suborders. But how are we to interpret the further fact that compound testes of the pedicellate type are characteristic of the Phytophaga, Rhynchophora, and Lamellicornia? Ganglbauer considers this a fact of so much importance as to preclude the idea that those groups have been derived from any other existing groups of Polyphaga. The Rhynchophora probably are, he thinks, derived from the Phytophaga; but the origin of the Phytophaga and Lamellicornia is doubtful, and must be looked for in some ancient Malacoderm-like ancestors, but not in any still existing forms.

Lameere and Kolbe attach less importance to the pedicellate structure of the testes, and seem to think it may be derived independently from the other types met with in the Polyphaga. Lameere would place the origin of the Lamellicornia and Phytophaga near that of the Heteromera and Clavicornia in some Cucuji-form ancestor. Kolbe also looks upon the Phytophaga, Heteromera, and Clavicornia as nearly related groups, and thinks the Phytophaga have been derived from primitive Clavicornia. But he takes a different view with regard to the Lamellicornia. He places this group and the Staphylinoidea together to form the first of the two main divisions into which he subdivides the Polyphaga, including in the same group with the Lamellicornia the family Synteliidæ, through which, he says, they show a relationship with the Staphylinoidea.

His reasons for this course will be discussed further on, when we come to consider the characters derived from the external anatomy.

Not only are there the differences pointed out in the structure of the testes themselves, but differences also in the number, position, and origin of various accessory glands that open either into the *vasa deferentia*, or arise from the common duct to which they lead. Some of these are assumed to be, like the testes and *vasa deferentia*, of mesodermal origin, while others are believed to arise as ectodermal invaginations; and Escherisch has classed them accordingly into *mesadenia* and *ectadenia*. When more general conclusions can be drawn from them, they may play a more important part in the classification. At present, though used by Ganglbauer in characterizing the groups, they seem to be of only doubtful value.

* *Timarcha* and *Melasoma*. Ganglbauer suggests that these exceptions may not be real ones, since a mistake may have arisen from a confusion of names; but I have reason to believe that no mistake has occurred.

(To be continued.)

AN ALGERIAN HOLIDAY.

BY A. E. GIBBS, F.E.S.

(PLATE VI.)

(Concluded from p. 140.)

TLEMÇEN is a wonderful and seductive town, with beautiful mosques and surrounded by ancient walls, a place which, once visited, cannot be forgotten, but which inspires a longing to return and linger once more in its ancient streets, or wander among the ruins which are scattered with prodigal profusion over the surrounding country. It is built at the foot of another of the ranges which go to make up the Atlas, the western horizon being bounded by the high mountains of Morocco. From the point of view of the antiquary and historian it ranks among the most interesting cities in the world, but a wholesome fear of the editor's blue pencil deters me from getting too far off the track, and I must get back to the insects. The morning after my arrival, Tuesday, May 31st, found me on the hillside above the town. The tantalising and elusive *pandora* greeted me among the gardens outside the walls. *Pieris brassicæ* and *Rumicia phlæas*, the latter with hind wings rather strongly tailed, fell victims, and then on a bare hillside I caught sight of an insect which I took to be *Melitæa phœbe*, but a closer acquaintance showed that it was something new. A second specimen was taken near by, but these were the only two seen. They proved to be *M. ætherie* var. *algerica*, Stgr., and I take it they belonged to a second generation which was just making its appearance, as they were in the pink of condition and had evidently only just emerged. Allard* records its occurrence at Lambessa in April. The most abundant "blue" was *Polyommatus astrarche*, of the form known as *calida*, a fine variety with a reddish-brown ground colour and strongly developed orange submarginal spots. Miss Fountaine mentions† the capture of this insect at Tlemçen in July, 1904.

Working my way down the hillside again by a steep and narrow path between the gardens, where I took a few each of *P. egeria* and *P. megæra*, I found myself in the Arab cemetery. Striking upwards once more a female of the summer brood of *Papilio podalirius* was discovered sunning itself on the foliage of a young tree, and was the only example to fall to my lot of a species I expected to find rather abundant, but I subsequently saw a second specimen in the forest while travelling by train from Tlemçen to Lallah Maghnia. Continuing the ascent I arrived at the beautiful mosque of Sidi-Bou-Medine, with its graceful minaret and elaborately carved doorway, rich with tile-work and mosaics. Very lovely indeed is this structure, nestling in the

* 'Annales de la Société Entomologique de France,' 1867, p. 314.

† 'Entomologist,' xxxix. 108.

greenery of the steep hillside. Attached to it is a *médersa*, or Arab university, and when I was again at the spot a few days later an Arab gentleman, apparently some one of importance, came out to inspect my net and find out why I was catching butterflies. One thing he wanted to know was whether I ate them! After leaving the mosque I got into someone's garden, and there I took my third specimen of *E. eupheno*. But it was not until the city gates were almost reached that the great event of the day happened. Just outside Tlemçen, in a market garden, was a bank clothed with tall milk-thistles five or six feet high, which were in full flower, and on the blossoms several magnificent *Dryas pandora* were settled, and I thus learned that the way to catch this beautiful creature was to take it while resting on these flowers. Six specimens, one after the other, were caught in this way, and I made a point of visiting this particular bed of thistles whenever possible about noon, and so secured a nice series. After lunch another part of the hillside was explored, but without much satisfaction, *Anthocharis* var. *ausonia* being the most noteworthy butterfly netted. Three more of them were taken the next morning, when I visited the remarkable remains of the old city of Mansoura. Close to the ruined mosque I discovered another big clump of milk-thistles, where *pandora* was disporting itself, and after an uncomfortable hunt among these prickly plants I managed to add three to my series. *Polyommatus* var. *calida* was again in evidence, the only other Lycænid taken being *P. icarus*. On leaving the ruins of the city I climbed the hill and traced the course of the ancient conduit, constructed to bring the waters down to fertilise its gardens and fill its fountains, but now used for the more prosaic purpose of driving an oil mill. Descending again nearer Tlemçen I found *fortunata* abundant, but the steep declivity forbade a very prolific chase. The remains of yet another large city are to be seen near Tlemçen. Agadir, whose ruins are scattered over a considerable tract of ground, was built on the site of the Roman Pomaria. Many beautiful koubbas are to be seen in the woods, and the tower of the old mosque is still in a fair state of preservation. But I am wandering into archæology again, and must only say with regard to Agadir that *pandora* haunts its ruins as it does those of Mansoura.

I was invited by a fellow-countryman whom I met in the hotel at Tlemçen to accompany him to Lallah Maghnia, a fortified post on the Moroccan border, and I gladly joined forces with him for the expedition. Although I believe the place can boast a respectable past, it consists now for the most part of a modern-looking small town, which has sprung up round the military station. During the three days of my visit there was a very cold wind blowing, and the only spots in which insects were to be found were the deep gulleys cut through the fields by the rains

of winter. In the shelter of these I discovered two interesting varieties of *Cænonympha pamphilus*, namely, one specimen of var. *thyrsides* Stgr., which has a row of submarginal black points on the upper side of the hind wing, and two specimens of var. *lyllus*. My other captures were *E. passiphæ* var. *philippina*, *L. icarus*, some Hesperids, and, of course, *P. cardui*, which was everywhere.

On June 4th we drove to the very curious and primitive Berber town of Nedroma, an exceedingly cold ride across the hills. At this place *Satyrus abdelkader* is known to occur, but we were too early for it, and if the date had been right, the weather was wrong. There were occasional gleams of sunshine as we crossed the hills, and during one of these we pulled up and I took the local variety of *passiphæ* and *A.* var. *glauce*. At Nedroma itself the only insects seen were solitary individuals of *P. rapæ* and *P. brassicæ*, which were flying in the garden behind the village shop, which also served the functions of an inn, where we were able to get something to eat. As we left the town I got a glimpse of *pandora*, but not much else was seen on the way home until we reached some hot springs a few kilometres from Lallah Maghnia where *C.* var. *helice* was found. On Sundays a great cattle market is held at Lallah Maghnia, which is well worth visiting, especially by those who are on photography intent, for it is frequented largely by Moroccan dealers, who come with their camels and flocks and herds, and pitch their tents in the market place. They are, however, a very rough and lawless lot, and caution is necessary when using the camera. Another visit was paid on the morning of June 5th to the gulleys in the cornfields when nothing fresh was obtained, though it was not to be wondered at considering the strength of the wind, which hardly permitted the use of the net. This brought my entomological experiences in Algeria to an end, except for the fact that as our boat was moving away from the quay at Oran, our old friend *pandora* flew from the gardens above and circled round us, which we accepted as an omen of a satisfactory journey; nor were we disappointed.

Miss Fountaine's visit to Algeria in 1904, which I have already referred to, extended from January till August, and she explored districts between Biskra in the east and Sebdou in the west. Several of the localities I have written about were included in her itinerary, but she had the advantage of somewhat prolonged collecting in the cedar forest at Teniet-el-Haad, which I did not visit, and at La Glacière, where I only spent a few sunless hours. Nor was I able to travel in the interesting districts to the east of the capital. She has recorded the occurrence of sixty species of Rhopalocera, as against the twenty-eight which I captured during the fortnight I was in the country. No doubt the weather is largely responsible for my small number of records. To Miss Fountaine's list I can add *Colias edusa* var.

helice, *Pyrameis atalanta*, *Cænonympha arcanioides*, *C. var. thyrsides*, and *Adopæa actæon*.

The following is a list of my captures :—

Carcharodus alcææ, Esp.—Tlemçen, May 31st; Lallah Maghnia, June 3rd.

Hesperia alveus, Hb.—Saida, May 28th.

Adopæa actæon, Rott.—Lallah Maghnia, June 3rd.

A. thaumas, Hufn.—Lallah Maghnia, June 3rd.

Rumicis phlæas, L.—Blidah, May 25th and 26th; Oran, May 30th; Tlemçen, May 31st and June 1st and 2nd.

Cupido lorquini, H.-S.—Blidah, May 26th; Tlemçen, May 31st.

Polyommatus icarus, Rott.—Tlemçen, May 31st and June 1st; Lallah Maghnia, June 3rd.

P. astrarche var. calida, Bellier. — Tlemçen, May 31st, June 1st and 2nd.

Papilio podalirius, L.—Tlemçen, May 31st; between Tlemçen and Lallah Maghnia, June 3rd.

Pieris brassicæ, L.—Tlemçen, May 31st, June 1st and 2nd; Nedroma, June 4th.

P. rapæ, L.—Blidah, May 25th and 26th; Saida, May 28th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd; Nedroma, June 4th.

P. napi, L.—Blidah, May 25th.

Anthocharis belia var. ausonia, Hb.—Blidah, May 26th; Tlemçen, May 31st and June 1st.

A. belemia var. glauce, Hb.—Saida, May 28th; Oran, May 30th; Lallah Maghnia, June 4th.

Euchloë eupheno, L.—Blidah, May 26th; Tlemçen, May 31st.

Colias edusa, F.—Blidah, May 25th and 26th; Hammam R'Irha, May 27th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd. *Var. helice*, Hb.—Oran, May 30th; Lallah Maghnia, June 4th.

Gonepteryx cleopatra, L.—Blidah, May 25th.

Dryas pandora, Schiff.—Oran, May 30th and June 6th; Tlemçen, May 31st and June 1st and 2nd; Nedroma, June 4th.

Melitæa ætherie var. algerica, Stgr.—Tlemçen, May 31st.

Pyrameis cardui, L.—Blidah, May 25th; Oran, May 30th; Tlemçen, June 1st and 2nd; Lallah Maghnia, June 3rd and 4th.

P. atalanta, L.—Tlemçen, June 1st.

Pararge megæra, L.—Hammam R'Irha, May 27th; Tlemçen, May 30th, June 1st and 2nd; Lallah Maghnia, June 3rd and 4th.

P. egeria, L.—Blidah, May 25th and 26th; Hammam R'Irha, May 27th; Tlemçen, May 31st, June 1st and 2nd; Lallah Maghnia, June 3rd, 4th, and 5th.

Epinephele jurtina var. fortunata, Alph.—Hammam R'Irha, May 27th; Saida, May 28th; Oran, May 30th; Tlemçen, May 31st, June 1st and 2nd; Lallah Maghnia, June 3rd, 4th, and 5th.

E. passiphæ var. philippina, Aust.—Oran, May 30th; Lallah Maghnia, June 4th and 5th.

Cænonympha arcanioides, Pier.—Blidah, June 25th and 26th.

C. pamphilus var. lyllus, Esp.—Lallah Maghnia, June 3rd. *Var. thyrsides*, Stgr.—Lallah Maghnia, June 3rd.

Melanargia lucasi, Rbr.—Saida, May 28th.

[Note.—The undetermined Zygænid mentioned in line 23, p. 138, is *Zygæna hilaris* var. *algira*, Obthr. I have five rather variable specimens, two taken at Blidah and three at Hamman R'Irha. For some interesting notes on the geographical variations of this species, see Monsieur Charles Oberthür's 'Etudes de Lépidotérologie Comparée,' iv. 599.]

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 152.)

Artona (?) *taiwana*, sp. n.

Head and thorax metallic-blue; abdomen black, segments edged with metallic-blue. Fore wings blue-black, with hyaline streaks between the veins, those on dorsal half longest. Hind wings hyaline; veins blackish, greyer towards the base, margins black.

Expanse, 20 millim.

Collection number, 682.

One example of each sex from Kanshirei (1000 ft.); the male taken in August, and the female in May, 1907. The male specimen is brownish, but as it is much rubbed, the colour of the female, which is in fine condition, is given in the above description; the hyaline markings appear to be alike in both sexes.

Parasiccia punctilinea, sp. n.

♂. Fore wings pale greyish with a slight brown tinge; a black dot at the base, one just beyond, and two on the costa; antemedial line represented by four black dots; a black dot in the cell, and a lunular one at end of the cell; medial line blackish, bent outwards and twice angled below the costa; area beyond medial line and up to the postmedial series of black dots powdered with blackish scales; submarginal line blackish, interrupted, tapered towards the inner margin; marginal dots black. Hind wings rather paler, fuscous tinged. Under side of the fore wings fuscous grey; hind wings paler, with blackish mark at end of cell.

Expanse, ♂ 23 millim., ♀ 28 millim.

Collection number, 677.

One example of each sex from Kanshirei (1000 ft.); the male taken in April, 1908, and the female in April, 1906.

Allied to *P. nocturna*, Hampson.

Norraca curvilinea, sp. n.

♂. Antennæ fasciculate. Head and thorax pale greyish brown, the hinder scales on metathorax tipped with dark brown; abdomen tawny above. Fore wings pale greyish brown, minutely freckled with darker; a blackish dot in the cell and three small ochreous patches below it; an ochreous patch on the inner margin before the tuft of short brown-tipped scales; ante- and postmedial lines dark

brown, the former only indicated towards the costa and the inner margin, the latter gently curved from middle of inner margin to apex; fringes dark brown. Hind wings ochreous brown, suffused with darker, a patch of tawny hairs on the abdominal area. Under side pale ochreous brown, the costal area of fore wings clouded with darker.

Expanse, 46 millim.

Collection number, 1679.

One male specimen from Arizan (7300 ft.), June, 1908.

Perciana taiwana, sp. n.

♂. Head and collar brown; thorax and abdomen grey, the latter with brown tufts. Fore wings pale reddish brown, area beyond the postmedial line freckled and clouded with darker brown and blackish grey; all margins slightly freckled with greenish grey; antemedial line blackish, only distinct on the inner margin; postmedial blackish, wavy, inwardly shaded with brown, elbowed opposite end of cell, where, with the black discoidal, it outlines the black reniform stigma; orbicular, minute, black outlined; submarginal line blackish, outwardly edged with whitish, black outward projections towards costa and at middle; inner margin brown between ante- and postmedial lines; a brownish oblique dash towards the base of the wing. Hind wings fuscous, with traces of dusky cell spot and irregular transverse line beyond, the latter black at anal angle.

♀. Fore wings greenish grey, suffused with pale brown on basal three-fifths; mottled with brown and streaked with darker on outer two-fifths.

Expanse, ♂ 30 millim., ♀ 36 millim.

Collection number, 1746.

One example of each sex from Rantaizan (7500 ft.), May, 1909.

Closely allied to *P. marmorea*, Walk.

Polia ornatissima, sp. n.

Head and collar white; thorax blackish, mixed with brown and marked with white; abdomen grey brown, whitish mixed, especially on basal and last segments. Fore wings blackish, costa and inner margin marked with creamy white; white spot at base of the costa, and one near it above the inner margin; orbicular and reniform stigmata, and a spot below, white; three white spots on outer margin, the largest spreading to apex; antemedial line represented by an oblique series of five spots, the first and fifth white, the others ochreous ringed; postmedial line white, macular, curved beyond the reniform; fringes ochreous brown chequered with white; all white markings more or less edged or flecked with ochreous. Hind wings whitish with a black discoidal spot; postmedial line blackish, wavy, not extending to costa or inner margin; marginal line dusky, black between the veins.

Expanse, 48 millim.

Collection number, 1767.

One female specimen from Rantaizan (7500 ft.), May 12th, 1909.

Trilocha brunnea, sp. n.

Head, thorax, and abdomen dark chocolate-brown, crown of head paler. Fore wings dark chocolate-brown, costal and inner marginal areas paler brown; ante- and postmedial lines reddish brown, double, only distinct on the inner marginal area; a bar of the ground colour at end of cell. Hind wings pale reddish brown, inner margin pale brown marked with darker. Under side: fore wings chocolate-brown, veins ochreous tinged; hind wings ochreous brown, clouded with chocolate-brown on the margins; a black dot at end of cell, and two wavy brown transverse lines beyond, the first indistinct except on inner margin.

Expanse, 37 millim.

Collection number, 1792.

One male specimen from Rantaizan (7500 ft.), May, 1909.

The fore wings are considerably rubbed, so that the markings are more or less obliterated.

There is an example of this species, from India, in the British Museum Collection.

BEES FROM THE HIMALAYA MOUNTAINS.

BY T. D. A. COCKERELL.

In this Journal, Sept. 1910, I gave an account of some bees collected high up in the Himalayas by the British Tibet Expedition. I am indebted to Mr. G. Meade-Waldo for an opportunity to examine other bees from this Expedition, which are now recorded.

Bombus bizonatus, Smith.

♀. Khamba Jong, Sikkim, 15-16,000 ft., July 15th to 30th, 1903.

Bombus waltoni, Cockerell.

Mr. A. Skorikow writes me expressing the opinion that *B. waltoni* is identical with his *B. mendax* subsp. *chinensis*, the latter having about ten months' priority. If so, *waltoni* nevertheless stands, as there is a different *chinensis*, Dalla Torre, 1890. The description of *chinensis*, Skor. is wholly in Russian, but my friend Mr. E. Kaydin has been good enough to translate it for me. It certainly applies well to *waltoni*, except that in *waltoni* the red hair on the abdomen begins on the apical part of the second segment, whereas in *chinensis* the third segment has a sprinkling of reddish hair, and the full red only begins on the fourth. This difference may be only varietal.

Nomada gyangensis, n. sp.

♂. Length $11\frac{1}{2}$ mm., expanse 23; black, yellow, and red; head and thorax black, with abundant dull pale yellowish hair, that on under side white; mesothorax and upper part of head dull, coarsely rugoso-

punctate; head broad, mandibles simple, malar space distinct; labrum, mandibles (except apex broadly), malar space, clypeus (except upper part) and lateral face marks ending in a point on orbital margin at about level of antennæ, all lemon yellow; antennæ ferruginous beneath, black above; scape rather thick; third antennal joint slightly longer than fourth above, but shorter than it below; upper margin of prothorax, tubercles, stripe bordering each side of mesothorax, large spot on anterior part of pleura, two large spots on scutellum, a small short line on postscutellum, and a spot on each side of metathorax, all yellow, variously suffused or margined with red; scutellum moderately prominent; tegulæ yellow; wings slightly dusky, strongly so at apex; stigma rather small, bright ferruginous; venation ferruginous basally, fuscous apically; b. n. meeting t. m.; first s. m. about as large as the other two united; first r. n. joining second s. m. much beyond middle; legs red, anterior femora with a black stripe beneath, middle with a broader stripe, hind ones nearly all black behind and beneath, but red at apex and base behind; apices of tibiæ and outer sides of basitarsi yellow; abdomen finely and closely punctured, all the segments with broad yellow bands, inclined to be edged with red; basal part of segments black, apical margins brown, yellow band on second segment deeply emarginate in middle; apical plate yellow, densely and coarsely punctured, entire; venter with four broad yellow bands, the fourth emarginate on each side.

Hab. Gyangtse, 13,000 ft., June, 1904 (H. J. Walton). British Museum. This belongs to the subgenus *Holonomada* of Robertson. In the tables of Indian species by Nurse and Bingham it runs to *N. decorata*, but that species has the pubescence whitish and sparse. In Schmiedeknecht's table in 'Apidæ Europææ,' it runs out at twenty-six on p. 46. Superficially, it is not unlike the European *N. sexfasciata*, but it differs in many details.

Anthophora vulpina waltoni, Cockerell.

Both sexes from Gyangtse, 13,000 ft., June, 1904 (H. J. Walton). The male, to my surprise, has the light hair of head and thorax above, and first abdominal segment a warm red. I think it certainly belongs to *waltoni*; a similar dichroism occurs in the American *A. occidentalis*, but is not sexual; further material may prove that it is also independent of sex in *waltoni*. The male *waltoni* has the clypeus lemon yellow, with only marginal black dots, instead of the large black patches of *vulpina*.

Anthophora khambana, Ckll., var. *atramentata*, n. var.

♀. Hair all black, except segments 2 to 4 of abdomen above (excluding sides), where the hair is bright red as in the type; and the white subapical tufts beneath, which are retained. A variety analogous to the variety *schenkii* of *A. parietina*.

Hab. Khamba Jong, Sikkim, 15-16,000 ft., July 15th to 30th, 1903. British Museum.

A NEW APHID-INFESTING *APHELINUS* WHICH IS NOT BLACK.

BY A. A. GIRAULT (The University of Illinois).

IN October, 1908 ('Entomological News,' Philadelphia, xix. pp. 365-367), Dr. L. O. Howard summed up the existing knowledge of the species of the Eulophid subfamily Aphelininae known to be parasitic upon aphids, and at the same time described two new forms with the same habit. All of the aphid-infesting Aphelininae, according to Dr. Howard, are species of the genus *Aphelinus*, Dalman, and all are characterized by having a preponderance of black in their coloration, and by having hairy eyes. That is to say, all are of the general appearance of the first known aphid-infesting species, the common *Aphelinus mali* (Haldeman). It is, therefore, somewhat novel to find a species of this group which is an undoubted aphid parasite, but which is totally yellow in colour, with practically hairless eyes, and which resembles very closely the coccid-infesting *Aphelinus mytilaspidis*, Le Baron. This novel aphid-infesting species differs from *mytilaspidis* in being more intensely yellow, nearly a pale green in colour, the last-named species being about the shade of yellow known as gamboge; structurally, it differs markedly in the quality of the discal ciliation of the fore wing proximad of the oblique hairless line, namely, in having those cilia very much coarser and arranged only in about four lines (a fifth line farther proximad and separated from the others by a naked area), the lines separated, and the cilia at least four times coarser than the dense, moderately fine discal ciliation distad of the hairless line. The oblique hairless line of the fore wing is decidedly broader than is the case with *mytilaspidis*, and another difference is present in the penultimate antennal joint which is shorter, only a fourth of the length of the ultimate joint, or even less, and wider than long. In *mytilaspidis*, the penultimate joint is distinctly longer than wide, and nearly a half of the length of the ultimate or club joint. Taking the foregoing into consideration, this new species need not be confused with any other species of the genus.

Aphelinus automatus, sp. n. (Normal position).

Female.—Length, 0.90 mm. General colour uniformly pallid green, the eyes and ocelli red, the tips of the mandibles fuscous, the venation concolorous with the body and the wings wholly hyaline. Immaculate.

Structurally as in *Aphelinus mytilaspidis*, Le Baron, excepting as mentioned above. Proximad of the oblique hairless line of the fore wing are about from three to four lines of discal cilia which are coarse and at least four times larger than the normal, rather fine discal ciliation of the wing distad of the hairless line. Still farther

proximad, separated by a naked area somewhat as in *mytilaspidis*, but much longer (cephalo-caudad), there is another line of about five or six cilia, somewhat smaller. The fore wing, proximad, in this species is broader than in *mytilaspidis*; also the proximal tarsal joint of the caudal legs is shorter and stouter, and the short, sessile stigmal vein is bent more at right angles to the marginal. The mandibles of the two species also differ, in *mytilaspidis* having at least two outer (lateral) teeth which are distinct and acute, and a third inner one which is smaller, weak, and obtusely rounded; in *automatus* there is only a single outer, distinct, acute tooth, and a second inner one which is broadly truncate and separated from the first by a small, acute notch. (From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen reared from *Chaitophorus*, new species on poplar, Chicago, Illinois, September 15, 1910 (J. J. Davis). The specimen issued from a single round hole in the dorso-lateral aspect of the abdomen of its host, whose body was black in colour and attached firmly to the leaf surface.

Habitat.—United States—Chicago, Illinois.

Type.—Accession No. 44,229, Illinois State Laboratory of Natural History, Urbana, Illinois, U.S.A.; one female in xylol-balsam.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

BY E. H. STRICKLAND (Dip. S.E.A.C.).

(Continued from p. 134.)

A NEW SPECIES FROM SOUTH QUEENSLAND.

Two female specimens from South Queensland, sent by Dr. Bancroft, both proved to be representatives of a new species of the genus *Culicelsa* (Felt).

The *type* specimen has been forwarded to the British Museum.

Culicelsa queenslandis, n. sp.

Thorax clothed with light yellow and golden yellow scales, arranged in longitudinal bands. Scutellum with pale yellow scales. Abdomen black scaled with incomplete ochreous basal bands, and snowy white lateral spots. Tarsi with snowy white basal bands.

♀. Head very densely scaled. The narrow curved scales are golden yellow and larger and broader on the vertex than on the nape and sides of the head. There is a distinct border of small scales round the eyes. The upright forked scales are golden at the front of the head but black at the back. The lateral flat scales are ochreous. Antennæ with basal and second segments testaceous. Palpi longish with a white median band, and white scales at the apex. Eyes black.

Thorax with light yellow and golden yellow narrow curved scales, arranged in bands. Those forming the median band are light yellow, with a central narrow bare black line, the rest of the thorax being a light warm brown colour. On either side of this band is a golden yellow band. At the side of the thorax is a large central light yellow spot, with golden yellow scales before it and a golden yellow and black scaled area behind. Scutellum rather densely scaled with pale yellow narrow curved scales. Prothoracic lobes with creamy yellow narrow curved scales and golden brown bristles. Pleuræ with creamy flat scales. Abdomen with incomplete basal bands on all segments consisting of a few median ochreous scales and distinct snowy white lateral spots. Ventral surface with ochreous and a few dark scales. Femora dark scaled with a few scattered ochreous scales except for the basal half of the ventral surface which is all pale coloured. Tibiæ dark with a few pale scales arranged more or less in a line, unbanded. Tarsi with distinct white basal bands. Fore and mid legs with two apical joints unbanded. Hind with apical joint only unbanded.

Wings with mid and supernumerary cross-veins in a straight line. Posterior cross-vein about one and a half times its own length distant from the mid cross-vein. First fork cell narrower and longer than the second fork cell. Its stem rather over half the length of the cell.

Length 5.5 mm.

Habitat.—South Queensland.

Time of capture.—June.

Observations.—Described from two rather damaged females.

NEW SPECIES FOUND IN A SMALL COLLECTION OF MOSQUITOES FROM TASMANIA.

This collection was received by Mr. F. V. Theobald from Dr. Bancroft.

It was found that of the seven or possibly eight species represented only one had been already described. This species, *Culex frenchii* (Theobald), which had not been before recorded from Tasmania, was represented by three specimens which were quite true to type. Two other specimens, however, appeared to be either a variation of the type, or a distinct species. They differed mainly in possessing deeper coloured thorax and scutellum, both of which bear golden coloured bristles, whereas the type *Culex frenchii* bears black bristles.

As, however, both specimens were badly rubbed, it was impossible to state whether these represented a new species or not.

The mosquitoes of Tasmania appear to have been very much neglected in the past; three species only, all belonging to the genus *Culex*, are recorded in Mr. Theobald's 'Monograph of the Culicidæ of the World,' vol. v. 1910.

These species are *Culex rubithorax* (Macquart); *Culex australis* (Erichson), and *Culex nigrithorax* (Macquart).

The following genera are represented by the new species in this collection :—(1) *Culicada* (Felt), four species. (2) *Stegomyia* (Theo.), one species. (3) *Andersonia* (nov. gen.), one species.

Type specimens of these have been sent to the British Museum.

Culicada tasmaniensis, n. sp.

Thorax black, ornamented with mixed golden and brownish-black narrow curved scales, with a more or less distinct median spot of more creamy scales a little before the scutellum. Abdomen with broad white basal bands on all segments. Legs unbanded, femora mostly pale beneath. Wing membrane with a slight brownish tinge.

♀. Head dark brown in the middle, but lighter laterally with rather large creamy narrow curved scales, which are finer and smaller at the back of the head, where there are a few black upright forked scales. These are replaced in the front of the head by many long black bristles. The median flat scales are creamy and are interspersed with black bristles. Antennæ brown, second segment testaceous at the base. Palpi dark with several black strong bristles. Proboscis brown, darker at the apex than at the base. Prothoracic lobes with a few creamy white broad scales and black bristles.

The thorax is unornamented, except for the pale spot in front of the scutellum, the golden and dark scales being evenly distributed over the remaining area. Bristles are most numerous over the wing roots and round the base of the mesothorax, elsewhere they are practically absent. Scutellum with golden narrow curved scales, and strong posterior border bristles on all lobes. Abdomen dark with broad rather dull white basal bands on all segments, ventral surface mainly white scaled. Wings not very densely scaled, scales rather narrow and brown. First fork cell longer and narrower than second posterior. Supernumerary cross-vein nearer the base of the wing than the mid cross-vein, by about two-thirds of its own length; posterior cross-vein about one and a half times its own length distant from the mid cross-vein. Apices of all femora and tibiae more or less clothed with ochreous scales. Apex of hind tibia and base of hind metatarsus rather densely clothed ventrally with light coloured scales. Tarsi all dark. (Ungues $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$.) Halteres with light stems and dark knobs.

Length 6.5–8.5 mm.

♂. Scales on the head similar to those on the head of the female, but fewer bristles are present. The dark scaled palpi are about four-fifths the length of the proboscis. The fourth joint is somewhat shorter than the three preceding joints which are subequal. First joint slender, especially at the base; second joint with apex swollen, and bearing on this part long ventral hairs; third joint cylindrical and entirely clothed ventrally with long hairs, apical joint swollen towards the apex. Antennæ not very densely plumose.

Thorax and abdomen similar to that of the female, except that the ventral surface of the latter is mainly dark with broad basal pale bands, and the dorsal basal bands are more snowy white.

Legs similarly scaled to those of the females. Ungues apparently

all uniserrate, though not very clearly defined in the single specimen examined.

Length 6 mm.

Habitat.—Tasmania.

Observations.—Described from two females and one male.

It appears to be related to *Culicada nemorosa* (Meigen), though it is a decidedly larger species.

(To be continued.)

NOTES AND OBSERVATIONS.

THE EMERGENCE OF A BORNEAN CICADA (*Huechys sanguinea*, de Geer).—Having just watched a Cicada emerge from its pupa—or nymph—case for the first time, I took some notes of this curious performance which, perhaps, may be of interest to your readers.

The skin and half-emerged imago were brought to me about 11.45 a.m., having been found hanging on the stump of an old tree. Almost immediately the imago crawled out, free of the skin, and I spent an interesting three-quarters of an hour watching its development. The skin of the pupa case is split on the upper side only—longitudinally from anterior margin of the head to the cruciform elevation. The head and body were bright yellow, with two curious little delicate light blue wool-like excrescences on either side; these slowly began to swell—the tegmina first; during this process the basal margin (or “collar,” one might call it) of the pronotum was raised; I suppose this was to allow a fluid to run from thorax through the veins to extend the tegmina and wings, as I could see some swollen nervules below this upraised “collar.” Similarly the region of the cruciform elevation, and on either side of it, seemed to be connected with the extension of the wings, as that part was also swollen, the general colour being a very light-blue, like that of the basal region of pronotum. By 12 o'clock the tegmina had almost reached the end of abdomen, and in another seven or eight minutes the fully emerged imago was hanging by its fore legs only from the under side of a leaning twig which I had put in the glass cylinder for its use. It thus remained hanging by the fore legs only, both the tarsi and the coxæ of which I noticed were touching the twig. The tegmina were a beautiful blue-white colour; but at 4 p.m. I noticed the veins showed up dark grey, and by next morning this suffusion was further developed: although not yet complete, as the basal region was still streaked in appearance, owing to the grey suffusion not having overspread the internervular spaces. The head, thoracic and abdominal colouring had already deepened, thus losing its original bright yellow hue.

The nymph case has rather coarse and thick antennæ sheaths, prominent excrescences for the eyes and ocelli; the pronotal folds are distinct, the base of pronotum is coloured deep black, as are the posterior margins of mesonotum and of each abdominal segment on the upper side; the general colour being of light sand relieved by these transverse black stripes. The fore legs are typically fossorial, with stout femora each armed with a spine.

Borneo is particularly rich in species of Cicadidæ, no fewer than seventy odd species having been recorded. Among these is the gigantic *Pomponia imperatoria*, Westwood, which sometimes measures as much as eight and a half inches! The males are much attracted by light, and many good species have been captured at lighthouses in Sarawak, including two species new to science.—J. C. MOULTON; Sarawak Museum, February, 1911.

HYBERNATION OF PYRAMEIS ATALANTA.—I have read with interest the article by Mr. L. W. Newman in your issue of March, 1911 (*antea*, p. 99). While admiring his experiments, I would like to point out that they do not bear out his conclusion: that *P. atalanta* is not a true hybernator, as it requires food all the year. Mr. Newman is in effect arguing that, because *atalanta* kept through the winter in a warm room required food, they would therefore require food if hibernated out of doors in the cold, where they would not be artificially stimulated into activity. This, of course, does not follow. That England should have to depend on alien immigration for its yearly supply of *atalanta*, a fairly common butterfly here, is hardly conceivable. This theory also breaks down on Mr. Newman's own reasoning. Where are the supposed parents of the English *atalanta* to come from? France? If so, it must be the South of France, for the North of France conditions are similar to the English, and, were not *atalanta* a true hybernator, it would be unable to get its winter food in North France any better than in England. South France is a long way to come from. On the Riviera *atalanta*, in shabby condition, are to be met with practically throughout the winter. There, of course, they can find sufficient flowers all the year round to supply their modest needs. *V. antiopa*, on the other hand, I do not remember ever to have seen during the winter, although the finer weather of spring lures out hibernating specimens with the white borders, commonly supposed over here to prove British origin.—J. C. WARBURG; 21, Pembridge Gardens, W.

TROCHILUM APIFORME.—With reference to Mr. J. S. Carter's note on this species in the April issue of the 'Entomologist,' I would enquire whether the larvæ found in April, but as I understand without cocoons, in the pupating tunnels duly spun up? If so, this would prove that they were full fed, and would show that the time over which they form their cocoons extends from September or October till, at any rate, the spring. I have found that all the uninjured larvæ that I obtained in the autumn duly spun up, and several times where the top has been accidentally cut off a puparium in removing it the larva completed the cocoon. But two or three larvæ that I found in June, and which looked to be full fed, failed to spin up, and eventually died. I concluded that these were not really full fed, but would in the ordinary course have spun up in September or October. As regards treatment, I cannot help Mr. Carter, my luck having been no better than his. I believe I kept mine too moist, but it is difficult to hit off the *via media* between over-moistening, and thus producing mould, and keeping too dry, in which case the cocoon contracts and crushes the larva or pupa inside. I can breed to the imago ninety per cent. of full fed larvæ and pupæ of *Sesia vespiformis*, but *T. apiforme* defeats me, as I get only a small per-

centage to the imago stage.—C. G. NURSE; Timworth Hall, Bury St. Edmunds, April 9th, 1911.

PLUSIA MONETA.—Very few reports of this species seem to have been published recently, but, although the novelty of its appearance in this country has, no doubt, worn off, it seems a pity that reports of actual captures in more and more distant localities from its original place of landing (Kent) are not published. So far as I can trace, the extent of its spread from that county is indicated by reports from Monmouth (Ent. xxxvii. 214), Cheshire (Ent. xxxix. 291), and North Lincolnshire (Ent. xlii. 236). Has it not been found further north or west yet? And has it been taken in Wales, Scotland, Ireland, or the Isle of Man? I, for one, should be glad of the earliest records for these countries and for subsequent ones showing how the insect spreads, and I think it would be as well if these reports appeared in the 'Entomologist,' so that they would be permanently on record for future use.—C. NICHOLSON; 35, The Avenue, Hale End, Chingford, April 3rd, 1911.

PYRAMEIS ATALANTA AND VANESSA IO IN MIDDLESEX IN 1910.—In a recent note Mr. L. W. Newman (*antea*, p. 99) remarks on the general scarcity of *P. atalanta* last autumn. In the London parks, however, this butterfly was by no means uncommon; and on a sunny Sunday at the beginning of October I noticed several fine examples on the flower beds on the north side of Hyde Park. In Middlesex hereabouts *atalanta* was late, but not markedly scarce; *Vanessa io* also turning up in some force—a rather remarkable fact, in view of the wretched, sunless summer and the almost total absence of the species from the district for so many previous years. Early in March of this year single hibernators of the latter butterfly were flying during the brief spell of warmth which preceded the severe storms and cold of early April; and latterly I have seen quite a number of females about, in excellent condition, giving promise of a plentiful summer emergence, both here and on the southern approaches of the Chiltern Hills from Great Missenden.—H. ROWLAND-BROWN; Oxhey Grove, Harrow-Weald, April 24th, 1911.

SENTA MARITIMA.—I would like to record having taken var. *combinata* (Capper) of this species in the Isle of Wight last August; it is the second taken by me in the same locality, the other one being captured in August, 1909. The specimen just recorded is in the possession of Mr. Percy Bright, of Bournemouth.—CHARLES CAPPER; "Glyndale," Glebe Road, Barnes, S.W.

VANESSA ANTIOPA IN ENGLAND.—If a very hazy note may be permitted on Mr. Frohawk's remarks on p. 155, I remember reading in some book or periodical many years ago a statement by H. T. Stainton that, being in Scotland, he observed a larva of *V. antiopa* feeding wild on willow, and that he left it *in situ*,* fearing that he would not be able to rear it. Perhaps this vague recollection may enable someone to turn up the reference and so supply the needed "authentic instance."—REV. W. CLAXTON; Navestock Vicarage, Romford.

* E. M. M. vii. 109.—ED.

THE TAPPING OF ANOBIUM TESSELLATUM.—Judging from the notes on this subject by Mr. Gahan and Mr. Claude Morley in vol. xliii., some record by an eye- and ear-witness may be acceptable. Some years ago it was found necessary to replace a beam in the library of Cambridge University. When the old timber was taken out, it was found to be dreadfully riddled by *Anobium tessellatum* (now called *Xestobium rufovillosum*), and a lump of it was brought to me with several of the beetles, as well as its attendant *Corynetes*. The wood was placed with the beetles in a large glass receptacle on my writing-table, and for some days I had frequent opportunities of seeing and hearing the performance of the beetle. I regret very much that I took no notes, and can therefore only speak from memory. The beetle rests very quietly on the wood; the head is down below, on account of the peculiar formation of the thorax. The creature at intervals becomes restless, and, raising the front part of the body from the wood, rapidly lowers it, thus striking the wood with the front surface of the head. After several taps it becomes quiet again. My impression as to the number of strokes is that they were usually from three to six in number. I did not find that any impression was produced on its fellows by the performance, and if asked I should say that it is merely a restless habit. It will probably be easy to procure specimens of the beetle in the early summer in places where there are old large buildings; so that we may hope that someone will soon give us a better account than my recollection permits me to do. I would strongly advise that some of the wood it may be found in be placed with the beetle. Indeed, it should be kept in as natural a condition as possible, and the specimens should not be crowded.—D. SHARP; Lawnside, Brockenhurst, April 12th, 1911.

ODYNERUS CALLOSUS.—A few days ago a friend living in Stroud, Gloucestershire, sent me an insect which he met with basking in the sun on a stone wall not far from his residence on February 15th last. The insect was *Odynerus* (subgen. *Ancistrocerus*) *callosus*, Thom., a very common species here in the summer and autumn. It must have been a hybernated specimen. Can your readers inform me if they have ever met with this insect so early in the season? The date I consider worth recording.—V. R. PERKINS; Wootton-under-Edge, April 17th, 1911.

THE TUTT COLLECTION.—We all knew Tutt. Not only in this country but on the Continent of Europe also, and possibly far beyond, his name was to the entomologist a household word. His 'British Noctuæ and their Varieties' has for many years been a well-studied book; why, then, was so little interest manifested by those assembled at Stevens's Sale Rooms on April 11th, when the material that he had collected during the best years of his life, and on which this book was largely based, was offered at auction? A satisfactory answer is difficult to find, but the fact remains that many lots which contained the actual specimens on which his varietal names were founded brought no more than, if as much, as would an equal number of specimens from any ordinary collection. Thus, for example, a lot of 105 specimens, including *Bryophila perla* vars. *distincta* and *flave-*

seens, sold for 9/-, and one of 95, in which was included var. *suffusa* and others, 6/-; another lot of 115 specimens, containing among them *Leucania lithargyria* var. *pallida*, and many vars. of *L. impura*, brought only 3/-; while some 132 specimens, among which were included *Xylophasia rurea* vars. *nigrorubida*, *ochrea*, *flavo-rufa*, *intermedia*, and many others, sold for 4/-. Even the carefully worked-out series of *Agrotis tritici*, &c., failed to raise any enthusiasm, and after the first two lots offered fetching 7/- and 9/- respectively, prices dwindled again to the 4/- and 5/- level, and the climax was reached when the last five lots of the Noctuæ offered had to be lumped together to find a buyer at 3/- for 513 specimens of *Anchocelis*, &c., although simply bristling with named forms. Such a state of things gives pause for reflection; possibly the specimens were not all in the finest possible condition, but even, then, have they not some historic value?

Some other portions of the collection fared better. Four lots of four each of *Drepana sicula* (*harpagula*) brought from 30/- to 37/6 per lot, one of three 25/-, while others in perhaps not quite such good order, and sold in lots with other species, realized somewhat lower prices. A pair of *Gluphisia crenata*, to which the only datum was "Bucks," sold, with some 60 other specimens, for 10/-; *Notodonta trilophus* (Berwickshire, 1878), with others, 18/-; *Bryophila algæ* (Hastings, 1873), in a lot of 57 specimens, 8/-; and a very pale form of *Acronycta auricoma*, which, by the way, did not appear to have any special varietal name attached to it, sold, with eight others and five *A. myricæ*, for 24/-. Two lots of *Acronycta strigosa* of eleven each, of which six were bred from ova, realized 26/- per lot; a specimen of *Tapinostola extrema* (Isle of Wight, Sept. 1889), with some eighty other specimens, 21/-, and three lots of *Apamea connexa* (Rotherham and Barnsley, 1881-7), sold in lots of twelve for 32/6, twelve for 28/-, and nine for 24/-; while a lot of twenty *Agrotis obscura* (*ravida*), nine *A. simulans* (*pyrophila*), and sixteen others, brought 16/-, and three passable specimens of *Noctua subrosea* realized just 30/-.

Among the Continental Erebias offered at the same time, a dozen specimens of *Erebia palarica*, Chapman, put up in lots of three each, realized from 16/- to 20/- per lot, but none of the other species appeared to attract any great amount of attention—indeed, it was found impossible to place some of the lots offered. We understand that a further portion of the collection will be offered in the autumn, when it is to be hoped a greater amount of interest may be exhibited.—R. A.

THE well-known collection of British Lepidoptera formed by Mr. S. J. Capper, of Liverpool, has been privately purchased and been placed with Mr. Newman, of Bexley, for disposal. The collection is rich in varieties, and contains most of the "extinct species"; some few of the aberrations have already found their way into other collections, but there are still many interesting forms awaiting a new home.—R. A.

SURREY ORTHOPTERA.—Mr. J. G. Dalgliesh, of Midhurst, sends me the following addition to my list (*antea*, p. 51). Unless otherwise

stated, all were taken by himself :—*Labia minor*.—Witley, fairly common. *Forficula lesneri*.—Witley, two specimens, 1909. *Ectobius panzeri*.—One specimen taken whilst sweeping at Thursley in 1907. *Gryllus campestris*.—A colony between Eashing and Godalming, whence he received specimens. *G. domesticus*.—Several specimens received from a bakehouse in Haslemere in 1908. *Gryllotalpa gryllotalpa*.—Another specimen from Churt in 1908. *Leptophyes punctatissima*.—Witley, 1909. *Meconema thalassina*. Witley, 1909. *Phasgonura viridissima*.—Two specimens in 1908, near Thursley, on a sunny hedge-bank among nettles (J. G. D.). Specimens near Godalming (O. H. Latter). *Metrioptera brachyptera*.—Witley, 1909. *Conocephalus dorsalis*.—One near Witley, 1910. — W. J. LUCAS; Kingston-on-Thames.

LEPIDOPTERA AT SALLOWS AT WINDERMERE.—On the mild nights following the March east wind, sallows were very productive at Windermere. I visited a large willow-bush on the evening of April 1st, on which the *Tæniocampæ* literally swarmed. Of *munda*, scarcely two were alike, and some varieties were very extreme. Good varieties of *opima* and *incerta* were present, and *cruda*, *gothica*, *populeti*, and *rubricosa* fell in showers. The best captures, however, were *Calocampa exoleta* and *T. leucographa*. *Exoleta* is a rare insect at Windermere, and this pilgrim, a perfect specimen, was made very welcome. *Leucographa*, although resident in the district, has not been seen of late. The captured specimen was a male. Street-lamps, on March 29th, were very prolific. *Amphidasys prodromaria* seemed more than usually common, and I saw some exceptionally light and dark specimens. *Anticlea badiata* and *Polyploca flavicornis* were quite fresh, but *Hybernia marginaria* and *Anisopteryx æscularia* were very worn. — HELENA BROCKBANK; 22, Holly Terrace, Windermere, April 3rd, 1911.

THE ENTOMOLOGICAL CLUB.—Two meetings of this Club were held during March last: one on the 21st, at "Wellfield," Lingards Road, Lewisham, the residence of Mr. Robert Adkin; the other, on the 24th, at 58, Kensington Mansions, South Kensington, the residence of Mr. Horace Donisthorpe.

ERRATA.—Page 147, line 9, for "*egeria*" read "*megæra*"; line 13, for "*megæra*" read "*egeria*."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, March 1st, 1911.—Mr. G. T. Bethune-Baker in the chair.—Messrs. Lionel Armstrong, Government Entomologist to the Gold Coast, Gold Coast, West Africa; J. Platt Barrett, 30, Endwell Road, New Cross, S.E.; the Rev. Henry William Brutzer, B.A., Great Bowden Vicarage, Market Harborough; Messrs. P. P. Graves, Club de Constantinople, Constantinople; Thien Cheng Kung, Guardian Superintendent of Chinese Students in British India, care of the Curator, Mysore Government Museum, Bangalore, India; the Rev. A. Miles Moss,

Helm, Windermere; and Dr. Cuthbert F. Selous, M.D., M.R.C.S., L.R.C.P., Agra, Barton-on-Sea, New Milton, Hants, were elected Fellows of the Society.—Dr. Nicholson showed six specimens of *Cholera fuliginosa*, Er., an addition to the list of British beetles, from Alphington, Devon. This species closely resembles *C. nigrita*, Er., with which it is mixed in several collections, and is probably widely distributed in this country. Mr. Dollman has taken it at Harrow, Mr. Donisthorpe at Hartlepool, Mr. Taylor in the Isle of Wight, and it is also in the Bates collection.—Mr. L. W. Newman exhibited some sticks (the off-shoots of birch-stumps) containing larvæ of *Egèria culiciformis*; also sticks of *Salix caprea* containing larvæ of *Trochilium bembeciformis*, one of these showing the cap formed over the hole prepared for emergence. This species is not usually supposed to form a cap. The larvæ were not, as is generally thought, confined to living wood, some of those exhibited being in dead twigs. Also a living specimen of *A. culiciformis*, a species which the exhibitor remarked was easily forced.—Mr. G. T. Bethune-Baker showed a specimen of *Erebia ceto* which had been swept from the herbage without its head, which was probably held fast by a spider; nine hours after capture this insect had still been capable of fluttering strongly. He also exhibited a specimen of *Erebia* var. *adyte*, with a half-developed right hind wing; a specimen of *E. eriphyle* with no left hind wing, and a *Melitæa varia* with no right hind wing; in the two latter there was no trace of the wing having ever been developed.—Mr. A. Bacot communicated a note confirming the Hon. N. C. Rothschild's distinction between *Ctenocephalus canis* and *C. felis*, both of which he had bred from ova. He gave measurements showing the difference in size and shape between the eggs of the two species, comparing them also with those of *C. fasciatus* and *Pulex irritans*. He also read a paper entitled "On the Persistence of Bacilli in the Gut of an Insect during Metamorphosis," commenting on which Dr. Chapman observed that, in moulting (referring chiefly to Lepidoptera), a provision for increase of size is not the only object in view, but also the removal of various possible microbic enemies. In "laying up" for a moult a larva almost invariably first empties the alimentary canal; at the actual moult, not only the skin but the lining membranes of the tracheæ and of much of the alimentary canal are cast also. The threads drawn from the mouth and anus, consisting of the linings of the *primæ viæ*, often seem long enough to represent the whole tube; if this be so, then bacillary inhabitants would be got rid of, and in any case must be so to a great extent. It would be interesting to know what is the precise hiatus between the oral and anal portions, and what provision there is for establishing an aseptic condition of this portion of the tube.—Messrs. Ernest A. Elliott and Claude Morley communicated "A first Supplementary Paper on the Hymenopterous Parasites of Coleoptera."—The Secretary read to the Society a letter of condolence received by Dr. Chapman from M. Charles Oberthür, one of the Honorary Fellows, containing an appreciation of the late Mr. J. W. Tutt.

Wednesday, March 15th, Special Meeting.—Rev. George Wheeler, Secretary, in the chair.—The letter summoning the Special Meeting was read by the chairman, and, no other candidate having been pro-

posed, the Rev. F. D. Morice, M.A., was declared to have been elected President for the current year. The ordinary meeting followed immediately, the Rev. F. D. Morice, President, in the chair. The President addressed a few words to the Society, thanking them for their choice of him for the post, and expressing regret for the circumstances which had made an election necessary.—Messrs. George Moffatt Carson, Entomologist to the Government of New Guinea, Port Moresby, New Guinea; Alfred George Scorer, Hill Crest, Chilworth, Guildford; Percy William Affleck Scott, Chinese Imperial Customs Service, Hangchow, China; Noel Stanton Sennett, 32, Bolton Gardens, South Kensington, S.W.; James A. Simes, 2, The Byre, Whitehall Road, Woodford, Essex; P. H. Tautz, Cranleigh, Nower Hill, Pinner, Middlesex; R. G. Todd, The Limes, Hadley Green, N.; R. Vitalis, Commis de 1^{re} classe, Trésor, Pnom-Penk, Cambodia, French Indo-China; and Rev. W. G. Wittingham, Knighton Rectory, Leicester, were elected Fellows of the Society.—The President announced that he had appointed Dr. F. A. Dixey, M.A., M.D., F.R.S., and Messrs. G. T. Bethune-Baker, F.L.S., F.Z.S., and H. St. J. Donisthorpe, F.Z.S., to act as Vice-Presidents for the current year.—Mr. H. St. J. Donisthorpe exhibited a nest of *Lasius umbratus*, Nyl., which had accepted a ♀ *L. fuliginosus*. On December 13th a deilated ♀ *L. fuliginosus* was put into a small plaster nest with a dozen of the *umbratus* ♂ ♂; she was slightly attacked, but not in any way injured, and tried to conciliate the ♂ ♂ by stroking them with her antennæ; she protected her waist by crossing the back legs over it, and her neck by pressing the head back against the thorax. By December 21st she was accepted by the whole nest, and has been treated as their queen ever since. Only one or two ♂ ♂ occasionally threatened her with their jaws, though the first *fuliginosus* ♀ placed in the nest was killed. The ♂ ♂ killed most of their own virgin ♀ ♀.—Mr. W. C. Crawley also exhibited a case containing a colony of *Lasius umbratus* with a *L. fuliginosus* ♀ as queen, and a colony of *L. niger* with a *L. umbratus* queen. He mentioned that deilated ♀ ♀ do not always behave as if fertilized, the ♀ in this nest being restless as the winged ♀ ♀ are before the marriage flight.—Dr. Chapman began a discussion as to whether this form of “parasitism” was in the long run profitable to the parasitised species, by weeding out the weaker nests; the President, Mr. Verrall, and Mr. G. A. K. Marshall also joined in the discussion.—Mr. F. Merrifield exhibited 134 specimens of *Selenia bilunaria*, and read a short paper on the question whether temperature in the pupal stage may affect the size of the imago in some Heterocera. His experiments showed that in every case the imagines from the cooled pupæ are, on the average, larger than those from the forced, the difference ranging in the males from 1.3 to 20.8 per cent. (averaging 13.6 or 13.9), in the females from 0.7 to 9.5 per cent. (averaging 3.3 or 3.6). It seemed to him that the difference was too great and too diffused, embracing as it does each sex in five separate families, to be explained in any other way than this: that it is caused by something that, in consequence of the difference in temperature, happened to either those forced or those cooled, or both of them, in the pupal stage.—Mr. H. Main exhibited a stereoscopic photograph of the cocoon of *Chrysopa flava*,

opened to show the hibernating larva, and of the larva taken out of the cocoon to show how it lies coiled up with its tail over its head.—Mr. O. E. Janson exhibited larvæ and cases of a Psychid from Amboyna, the cases being beautifully constructed and closely covered on the exterior with small spines, intermixed with larger spines or thorns. The largest of the cases measured nine inches in length.—Dr. Chapman read a paper on “The British and a few Continental Species of the Genus *Scoparia*,” and showed photographs of the genitalia and a drawing to illustrate the neurulation.—The Secretary announced that the *Conversazione* was fixed for Wednesday, May 17th, and that the Linnean Society had kindly placed their Rooms at the disposal of the Society for that occasion, and were generously lending their lantern, making no charge for light or for the current for the lantern. He also announced that Professor Poulton and Mr. Enock had consented to give lectures on that occasion. As the arrangements with the Linnean Society preclude the sale of tickets, it will be necessary to ask for a subscription towards the expenses (for refreshments, printing, postage, &c.) from those who apply for them, and also strictly to limit the number for which each Fellow may apply. On the motion of Mr. Rowland-Brown, seconded by the Rev. G. Wheeler, a vote of thanks was unanimously passed to the President and Council of the Linnean Society for their kindness and generosity.—GEORGE WHEELER, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 23rd*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. J. H. Leslie, F.E.S., of Tooting, was elected a member.—Mr. Turner exhibited three Noctuids sent to him by Mr. Murray, of St. Anne's-on-Sea; two of the specimens were very dark melanic forms of *Agrotis*, superficially very similar, but which on close examination he considered to belong to two species, *Agrotis tritici* of the var. *nigra* form, and *A. nigricans* of the var. *fumosa* Fab. (nec God.). The third specimen was a worn *Luperina*, possibly referable to *L. cæspitis*, the small, grey, rough surfaced form sometimes met with on the coasts of Lancashire and Sussex.—Mr. Moore, the very beautiful leaf-moth of India, *Gloriana (Phyllode) ornata*.—Mr. Newman, (1) sticks, both living and dead, of sallow containing larvæ of *Trochilium bembeciformis*, and also some containing the similarly feeding larvæ of the musk-beetle, *Aromia moschata*; (2) a living specimen of *Egeria culiciformis*, bred after sixteen days' forcing; and (3) full fed larvæ of *Arctia caia* and *Callimorpha dominula*, which had been forced on; he stated that some larvæ of the former species had made no response to the treatment.—Mr. Kaye, a varied series of *Spilosoma lubricipeda* and its var. *zatima*, and asked if it had been obtained by anyone recently.—Mr. Adkin, melanic examples of *A. nigricans* to compare with Mr. Murray's specimens.—M. Tonge showed a series of lantern slides, each illustrating the complete life-history of a British butterfly.—Mr. Edwards, a set of slides illustrating the anatomy of a lepidopteron.—Mr. Main, slides sent by Mr. Hancock, of Birmingham, illustrating the structure, habits, and snares of spiders.

March 9th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. A. E. Gibbs exhibited a collection of Lepidoptera from the Cuna-

Cuna Pass, Blue Mountains, Jamaica, including the rare *Papilio homerus*, and fine local forms of *Aganisthos odius*, *Gynæcia dirce*, *Hymenitis diaphanus*, *Calisto zaugis*, *Adelpha abyda*, &c.—Mr. Adkin, a form of *Nola albulalis*, in which the dark brown band was reduced to a dark narrow stripe only, giving a much more delicate appearance to the insect.—Mr. W. J. Kaye, several Syntomid species of the genus *Pseudosphex* and the wasp models which they so closely mimicked in build, shape of antennæ, legs, colour, &c.—Mr. Sheldon, the two specimens of a Noctuid, about which much discussion as to their identity arose many years ago, &c., which were named *Agrotis helvetina*. They are now regarded as pale, putty coloured examples of *Graphiphora augur*.—Mr. Blenkarn, a pale xanthic form of *Epinephela tithonus*, from the Isle of Wight, and a fine dark clouded example of *Camptogramma bilineata* from the same place.

March 23rd.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Stanley A. Blenkarn, of Beckenham, was elected a member.—Mr. W. J. Kaye exhibited a series of *Xylina conformis*, all but one from Glamorganshire, and remarked on its occurrence and distribution.—Mr. Newman called attention to the devastation caused by some hitherto unknown disease among bees in the South of England. It was most contagious, and scarcely a hive remained over a large area.—Mr. Buckstone, a bred series of *Apocheima* (*Nyssia*) *hispidaria*, and gave particulars as to breeding. He also contributed notes on the occurrence of numerous dwarf examples of *Hybernia defoliaria* at Richmond; the pairing of *H. marginaria* male and *H. defoliaria* female; delayed wing development of *Chesias rufata*; pupation of *Triphæna pronuba* after hybernation without feeding; the finding of the ova of *Spilosoma menthastri* on the shell of a living snail; and the occurrence of batches of ova of *Hadena pisi* on a small plum-tree. Mr. Newman said that *A. hispidaria* readily pupated in two inches of soil if the bottom of the cage was the concrete floor.—Mr. R. Adkin, two varieties of *Arctia caja*, from Yorkshire larvæ. One with whole of fore wings dull smoky brown with very much diminished white markings, the hind wings black with only a few dull yellow, some ill-defined, patches; the other with a concentration of the lighter colour of the fore wing towards the base, and of the darker colour towards the apex, while the hind wings were bright orange-red with much reduced black markings. He also showed living *A. zonaria* with eggs *in situ* under bark of clematis.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held February 20th, 1911, at the Royal Institution, Colquhoun Street, Liverpool, Mr. Geo. Arnold, M.Sc., F.E.S., Vice-President, in the chair. The Vice-President delivered a lecture on "Ants," in which he dealt chiefly with the recent discoveries connected with the habits of the subterranean fungus-eating species and the curious procedure of the females when founding a new colony. The ants which infest trees, constructing their nests in hollow parts of the branches, were also specially dealt with, and the economic effect of their presence described. The lecture was illustrated by a large number of specimens, and also by means of drawings on the blackboard.—H. R. SWEETING & WM. MANSBRIDGE, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*February 7th, 1911.*
 —Mr. Chas. H. Williams was elected to membership.—Mr. S. J. Bell exhibited a series of *Anticlea rubidata*, all of bright red form, bred from Isle of Wight ova.—Mr. G. Brooks, a very dark brown *Smerinthus populi*, Barrett, 1910.—Mr. H. M. Edelsten, a series of *Malacosoma castrensis*, from Essex coast, including several unicolorous specimens.—Mr. V. E. Shaw, *Noctua augur*, var. *omega*, Finchley, June 28th, 1910, mentioned in Tutt's 'British Noctuæ,' &c., as a very rare form.—Mr. L. W. Newman stated that osier stumps collected for *Trochilium bembeciformis* were found to contain both full fed and young larvæ: the stumps being kept on the concrete floor of a hothouse during the winter, the young larvæ migrated from the small to the larger stems, fed up, and pupated. Mr. Newman also drew attention to the fact that, while larvæ of *Ægeria culiciformis* pupate head upwards in the stumps of birch, when feeding in year-old stems they pupate head downwards above the emergence cap.

February 21st, 1911.—Mr. L. W. Newman exhibited sticks showing borings of *T. bembeciformis* in both living and dead wood, also sticks containing larvæ of musk-beetle which feed side by side with *T. bembeciformis*, and display similar habits.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology. Vol. iv. No. 3, Dec. 20th, 1910; No. 4, March 10th, 1911. University Press, Liverpool.

THESE fine periodicals deal but little with entomology pure and simple, being mainly taken up with important papers on "Sleeping-Sickness" and other tropical diseases, mainly due to the operation of insects. The last paper of each number (in both cases by R. Newstead and H. F. Carter) is devoted to the description of new genera and species of mosquitoes. These are well illustrated, and should appeal to readers of the 'Entomologist' who study the Diptera. There is also a paper on *Glossina* by R. Newstead in No. 3.

W. J. LUCAS.

On some New Species of Leaf-hopper (Perkinsiella) on Sugar Cane.
 By F. MUIR (Bulletin No. 9, Entomological Series. Hawaiian Sugar Planters' Association). Pp. 1-14, five figures in text. Honolulu, 1910.

OF the thirteen species of *Perkinsiella* referred to, eight are described as new. The author remarks that the species may be separated by superficial characters as tabulated, but that the males are best distinguished by the genitalia.

OBITUARY.—We have heard, with very great regret, that our valued correspondent, Mr. W. A. ROLLASON, died on April 17th last.

EXCHANGE.

Duplicates.—Larvæ of *Aurinia* (Welsh form). *Desiderata*.—Numerous.—*C. W. Williams*; *Penarth*.

Duplicates.—Ova: Versicolor from wild Scotch parents (Forres). *Desiderata*.—Early stages of most butterflies.—*A. W. Lynn*; 37, *Rodsley Avenue, Gateshead*.

Duplicates.—A few dozen ova, *Nubeculosa* females taken wild at Rannoch, April 10th, 1911. *Desiderata*.—Young larva *Iris*, or early stages of local and rare species, or offers.—*Charles Mellows*; *Bootham School, York*.

Duplicates.—Larvæ: *Hispidaria*, *Abietaria* (giving good percentage of black form). *Desiderata*.—Many *Geometer* larvæ, especially *Repandata* from Cornwall, North Devon, Delamere, Scotland, and Ireland.—*Brian A. Backlake*; 67, *Ringford Road, Wandsworth, S.W.*

Duplicates.—*Blandina* (Scotch), *Davus* (Scotch), *Geryon*, *Z. Trifolii*, *Griseola*, *Fascelina*,* *Pudibunda*, *Perla*, *Pudorina*, *Micacea*,* *L. Gueneii* (2, fair), *Hispidus*, *Ophiogramma*, *Cursoria*,* *Tritici*,* *Præcox*,* *Littoralis*,* *Ditrapezium*,* *Brunnea*,* *Thalassina*,* *Nigra*,* *L. Sparganii* (2), *Moneta*,* *Grossulariata* var. *Rubiginata* var. *Plumbata*, and many others. *Desiderata*.—Many *Geometræ* to renew; also early stages.—*W. Yates*; *Summerfield, St. Anne's-on-Sea, Lancashire*.

Duplicates.—Numerous set insects; also early stages. *Desiderata*.—Larvæ of *Grossulariata*, especially from Yorkshire and Lancashire: also ova and larvæ of many other species.—*Bernard S. Harwood*; 94, *Station Road, Colchester*.

Duplicates.—Black *Pilosaria*,* *Hamula*,* *Croceago*,* *Australis*, *Hastata*,* *Papilionaria*, *Palpina*,* *Ziczac*, *Autumnaria*,* *Unca*, *A. Ligustri*,* *Fascelina*,* *Zonaria*,* *Strataria*, *Meliloti*, *Conspersa*, *Togata*,* *Ditrapezium*,* *Muralis*, *Dictæa*, *Opima*, *Miniosa*, *Hispidus*, *Nigra*, *Arion*, *Hera*, *Piniperda*, *Irrorella*, *Rubidata*, *Berberata*, *Straminea*, &c. *Desiderata*.—Larvæ of *Grossulariata* (wild, Lancashire) and *Caja* (wild, Blackpool district).—*W. J. Ogden*; 87, *The Common, Upper Clapton, London, N.*

Duplicates.—Pupæ: *M. Rubi* and *A. Villica*, and imagines of same freshly killed and unset after emergence. *Desiderata*.—Numerous.—*C. E. Newnham*; "*Netheravon*," *Ringwood*.

Duplicates.—*Plumigera*, *Camolina*, *Myricæ*, *Albovenosa*, *Neurica* (fair), *Geminipuncta*, *Typhæ* and var. *Fraterna*, *Pinastri*, *Cytherea*, *Sordida*, *Ravida* (fair), *Interjecta*, *Dahlia*, *Opima*, *Populeti*, *Suspecta*, and many others. *Desiderata*.—*Leporina*, *Turca*, *Reticulata*, *Captiuncula*, *Ditrapezium*, *Retusa*, *Conspersa*, *Occulta*, *Tincta*, *Festucæ*, *Interrogationis*, and many common *Noctuæ* and *Geometers* to extend.—(Rev.) *C. E. Raven*; 4, *Park Terrace, Cambridge*.

To CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of change should be sent to the Editor—

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THE ENTOMOLOGIST

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[No. 577

THE NATURAL HISTORY MUSEUM FOR NATURALISTS.

SURELY in no other country in the world would Natural History be placed officially in the same category as Chemistry or Physics. Yet that is apparently the classification favoured by H.M. Government of the present day and the Office of Works whose duty it is to look after the structural arrangements of our particular museum at South Kensington. As every entomologist is or ought to be aware, certain cellars, offices, and passages in the basement of this fine building are consecrated to the entomological collections. For years past these collections have been steadily growing in bulk, until, with the advent of the Walsingham Gift, the periodical library had to be "moved on," and every available square foot apportioned for cabinets, leaving but a trivial margin of elbow-room for the assistants whose work is done in these subterranean regions. By these, as by every other member of the Museum staff, however, this inadequate space has been regarded as a temporary shift. The day would surely come when the Trustees would be empowered to extend their borders on the remaining vacant sites formally allotted the Natural History Museum in 1899. That was then on the eve of the war in South Africa. With the campaign in progress, all hope of extension was abandoned for the time being; the staff was reduced, and the small sums saved thereby devoted to national needs! For ten years and more, therefore, the extension scheme has been hung up, and now there seems every reason to anticipate that it may be "drawn and quartered as well"! In other words, acting upon the advice of Sir Henry Roscoe and certain scientists concerned for the success of the projected "Science Museum," the Office of Works has decided to re-take the whole available "extension" space along the north side of the Natural History Museum; to allocate a part of it to the "Science Museum," and to use the remainder for

“approaches.” Meanwhile, the “Spirit Museum” is to be transferred from its present position on this site, and re-erected on the westward frontage facing Queen’s Gate—that is to say, exactly where the Entomological Section at present ends—despite the specially inflammable nature of its contents, hitherto purposely isolated from the main building. No wonder the Trustees are up in arms! No wonder that in a last appeal on the subject to the Office of Works they deprecate the “attempt to accommodate three important institutions, the Natural History Museum, the Imperial College of Science, and a much enlarged Science Museum, on so restricted a site,” as showing “a want of appreciation of the inevitable future of these institutions,” all three of which must needs be “hampered in their growth”! For we entomologists are not the only naturalists who will suffer by this astonishing attempt “to squeeze a quart into a pint pot,” even though that pint be *imperial*! As naturalists we have no quarrel with the chemists or any other scientists for whom the new Museum is designed. But we do protest most emphatically against the appropriation of Natural History Museum ground for alien purposes, and deeply do we regret that for the moment we have no entomological members of Parliament, as was the case a short time ago, to voice our arguments and ventilate our grievances. Meanwhile, a very widely signed memorial to the Government has been prepared in London with the co-operation of the leading Universities, and resolutions have been passed by the Linnean, the Entomological, and the Royal Horticultural Societies, stating the case for the appellants with unmistakable precision. Something has been said, too, about approaching the Prime Minister, the Minister for Education, and the First Commissioner of Works on the subject, and the Entomological Society, at all events, has asked to be represented if any such deputation is formed. For, at the time of writing, it is abundantly clear that the Department responsible for the present undesirable scheme has considered only one side of the question. We trust, therefore, that no effort will be spared to repair the omission, and by such means avert perhaps an irreparable injury being done to our particular branch of science. So far, we have not heard one “unofficial” voice raised in favour of the Government proposal. On the contrary, Sir Henry Roscoe himself appears to be quite dissatisfied with the space allotted the Science Museum, while no single word of encouragement has greeted the Office of Works scheme in the Press, scientific or otherwise.

H. R.-B.

THE REGULAR TEMPERATURE VARIATION IN *VANESSA URTICÆ*.

BY T. REUSS.



V. urticæ var. *amploides* var. *falcoides*.

THE above figure depicts in its left half a form of *V. urticæ*, which I will call var. *amploides*, with relatively broad wings and almost straight marginal wing-border in the fore wings; the second costal blotch is broadest next the median nervure, and the outlines of the spot are almost straight. The right-hand half of the figure shows a form which I will call var. *falcoides*. The wings are comparatively narrow, with strongly curved outer marginal border, in extreme specimens approaching the shape of *P. c-album*. The second costal blotch is deeply dentated in outline, and the *costal part is broadest*. The details here described appear to be the only ones in *V. urticæ** that regularly obey the influence of temperatures either above 15–20° C. (var. *amploides*), or below 15–20° C. (var. *falcoides*), and both forms are *larval* forms, not pupal—*i. e.* the pupæ of larvæ bred in warmth and sunshine will emerge as the form *amploides*, even if kept in the cool and dark, while larvæ reared in the shade and exposed to the cool night air will produce *falcoides*, even if the pupæ were immediately transferred to heat and sunshine.

The “normal” form of *V. urticæ* appears from larvæ which, as in nature, are exposed at night to temperatures much below and by day (if it is a sunny day) much above 15–20° C. The normal specimens of *V. urticæ* are intermediate between *amploides* and *falcoides*; sometimes a falcoid costal blotch goes with an amploid marginal outline and broad wings (this combination is normal in the Corsican var. *ichnusa*, in

* I reared and set over seven hundred specimens from fifteen batches of ova for reference on these points especially this season. The two specimens figured belong to brood vii.

which, however, as might be expected, the amploid wing breadth is *extreme*); sometimes a falcoid margin goes with an amploid costal marking, or else both details are without character.

The above note on the natural conditions under which the sun-loving Vanessid larvæ live necessarily suggests their exposure to great *contrasts* of temperature, which would yet in England be less severe, owing to less sunshine (also less in intensity) than on the Continent, especially in the southern parts. Already in a note in the Ent. Rec. pt. 2, 1910, I recorded certain measurements of temperature taken among the nettles of a hedge-bank, suggesting that the "*ground climate*" in which the Vanessid larvæ lived was very different from the conditions we ourselves moved in. Thus on the nettles the sunshine causes temperatures up to and over 37–40° C. for many hours, even in England, and the sun-loving larvæ will not shelter from it till the heat rises to 45° C. (compare also the sunshine records of meteorological stations). When night falls, the cold among the nettles is greater than higher in the air by condensation and evaporation of moisture (compare the meteorological records of the ground or grass temperature at night). Often slight ground frosts occur up to June, and again already in August, while on the same dates by day the sun could shine and cause records of over 40° C. Only a series of dull cloudy days would produce a more medium range of temperature, but every glimpse of sunshine would be utilized by the larvæ to bask in.

As has already been suggested, the normal or commonest form of *V. urticæ* appears like a "cross" between the forms characteristic of the day temperatures (*amploides*) and of the night and shade temperatures (*falcoides*), as, indeed, should be expected. But while the southern variety of *V. urticæ* var. *ichnusa*, by its very broad, straight-bordered wings, shows that warmth and sunshine are predominant in the climate in which it lives, the English *V. urticæ* are much more falcoid in character, being, indeed, often of the form *falcoides*, and proving that here the temperatures *below* 15–20° C. exert "the main pull" in their development.

Of *V. io*, the forms corresponding to the vars. *falcoides* and *amploides* of *V. urticæ* are vars. *mesoides* and *teloides* respectively (*vide antea*, pts. 12, 1909 and 1910, and Ent. Rec. pt. 1, 1911); and, again, the var. *mesoides* (the shade-temperature form) seems to be most common in England. This form, in addition to the characteristic alterations in the ocelli, also *often* shows the "falcoid" characters in wing shape and costal blotch (which, however, *never* appear in var. *teloides*, the heat form).

After rearing some twenty thousand specimens in all of both species, I have been forced to the conclusion that no other

varietal forms than those mentioned above are true "temperature" forms—i. e. that they can be produced *regularly in all members of any brood by the influence and within the limits of certain temperatures* acting on all stages, or at least up to the end of the larval stages, when already the direction of the ensuing pupal developments is, *in the case of these forms*, predetermined so far as to resist conversion by opposite influences acting on the pupal stage.

Thus the temperature limits within which *V. urticae* var. *fulcoides* (*V. io* var. *mesoides*) and *V. urticae* var. *amploides* (*V. io* var. *teloides*) are reared exclusive one of the other (but not exclusive of other forms of variation, the details of which associate with either the falcoid or amploid characters) can be given at 6–15° C. and 20–40° C. respectively. The most generalized form of expression would read: not above 15° C. = var. *fulcoides*, and not below 20° C. = var. *amploides*.

TWO NEW SPECIES OF TRICHOGRAMMATIDÆ FROM THE UNITED STATES AND WEST AUSTRALIA.

By A. A. GIRAULT (The University of Illinois).

ONE of the following two species extends the known limits of the genus *Ufens*, Girault, recently described from the United States, to West Australia.

Genus ABBELLA, Girault.

1. *Abbella nympha*, sp. n. (normal position).

Female.—Length, 0.65 mm. Moderate in size for the genus.

The same as the type species of the genus (*subflava*, Girault), but differing from it as follows: More intensely yellow, not light greenish yellow; substigmal spot of fore wing obscure, only a faint cloud being present under and against the stigmal vein; antennæ differing in that the first funicle joint is slightly longer than wide, the second joint globular, as long as wide, both joints not distinctly wider than long, as in *subflava*; fore wings differing in having longer marginal cilia, in being smaller and shorter, in bearing an oblique line of discal cilia running back from the stigmal vein, the line moderately short and slightly curved, consisting of four or five cilia; also in having finer and denser discal ciliation.

With the general appearance of *Westwoodella americana* (Ashmead), Girault. General colour pale cadmium yellow, the colour uniform; antennæ concolorous, the legs pallid dusky yellowish, with the distal tarsal joint dusky; eyes and ocelli bright red; fore wings slightly fumated along their proximal halves, otherwise hyaline; venation concolorous with the legs. Abdomen having at least two

dorsal transverse black bands across the distal half, both apparently encircling its respective segment; also at least a black spot on each of the proximal segments, one on each side. Proximal and distal joints of the antennal club dusky. Otherwise, body practically immaculate.

Fore wings with about sixteen lines of discal cilia across their widest portion, the ciliation mostly in regular lines; the wing comparatively small and narrow, yet pyriform in shape, the blade regularly rounded distad, and with the marginal cilia moderately long, somewhat over a third the greatest wing width. Posterior wings with a paired distinct line of discal cilia along the cephalic wing margin, and a third line farther caudad, which is faint, and with its cilia separated more from one another in the line. Longest marginal cilia of posterior wing (caudal margin) slightly shorter than the longest cilia of the margins of the fore wing. Parapsidal furrows complete; abdomen conic-ovate, about as long as the head and thorax united, sessile, the ovipositor projecting slightly from its tip. Tarsal claws all moderate in length; tibial spurs single, straight, moderately short, absent on cephalic tibiae; strigils absent. (From one specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen in balsam, received from Dr. L. O. Howard, and labelled: "Parasite on *Diplosis*? in stems of *Ambrosia artemisiæfolia*. Issued May 21, '97." Probably from Jassid eggs in *A. artemisiæfolia*, Linn.

Habitat.—United States (locality unknown).

Type.—Type, No. 13,793, United States National Museum, Washington, D.C.; a female in balsam.

Genus *UFENS*, Girault.

1. *Ufens luna*, sp. n. (normal position).

Female.—Length, 0.60 mm. Exactly similar in general structure, appearance, and colour to the type species—*niger* (Ashmead)—but differing as follows: In the fore wings primarily: they have distinctly shorter marginal cilia, short in the type species, but here very short and close, hardly distinguishable from the edges of the wing; the discal ciliation is different, not so dense, the straight, distinct lines more numerous, consequently not peculiarly distinct as in *niger*; also the fore wing is fumated farther distad, and more distinctly, though not pronouncedly. In the legs: the posterior femora are more enlarged, ovate, and with a longitudinal lamellate sculpture. The posterior wings differ in being less pointed at tip, there the caudal margin bevelled off, curving convexly up to the tip of the straight cephalic margin; at this curve the marginal cilia abruptly shorten. Otherwise as in the type species, to which evidently it is closely allied. (From one specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

Male.—Unknown.

Described from a single female specimen received from Dr. L. O. Howard, mounted in balsam, and labelled : " 923. Perth, W. Austr. G. Compere."

Habitat.—West Australia (Perth).

Type.—Type, No. 13,794, United States National Museum, Washington, D.C. ; a single female in balsam.

BRACHYPTEROUS EARWIGS.

BY MALCOLM BURR, D.Sc., M.A., F.E.S., F.L.S., F.Z.S., &c.

IN the earwigs, as in the true Orthoptera, and also in the Hemiptera, we find that brachypterism in normally macropterous species, and *vice versa*, is a frequent form of dimorphism. Thus, in *Marava grandis*, Dubr., *Labia tetragona*, Bor., *L. unidentata*, P. Beauv., *Echinosoma parvulum*, Dohrn, *Allostethus indicum*, Hagenb., and many other species, macropterous specimens are as frequent as those with shortened wings.

The absence of the protruding squamæ, or chitinated portion of the wings, from beneath the elytra materially alters the superficial appearance of the creature. When the wings are abbreviated, the elytra are often, but not always, correspondingly reduced to a lesser, but distinct, degree, in which case they are apically truncate. The disturbance also frequently affects the pronotum: thus in *Marava grandis*, Dubr., in the macropterous forms, the pronotum is decidedly broadened posteriorly, the hinder margin gently convex, and hinder angles distinctly rounded; whereas in brachypterous specimens the pronotum is not trapezoidal, but square, the sides being parallel, and posterior margin truncate. The superficial appearance of the creature is so altered by these reductions that two dimorphic forms are not infrequently described as distinct species; thus *Forficula miranda*, Borm., and *Nesogaster aculeatus*, Borm., are respectively the macropterous and brachypterous forms of one and the same insect.

We find the same phenomenon in the polymorphic and ubiquitous *Labidura riparia*, Pall., of which some brachypterous forms, with reduced elytra and squared pronotum, have been placed in a special genus, *Demogorgon*, Kirby, which, needless to add, cannot stand.

But brachypterism has not yet been recorded in the common earwig, *Forficula auricularia*, L. There is, however, known in Italy a rather rare species *F. silana*, Targ. (*F. targionii* Br.), which only differs from the common species in the broader, more truly rectangular pronotum, truncate and somewhat shortened elytra, and aborted wings; it is, in fact, nothing more or less

than a brachypterous form of *F. auricularia*. But it is customarily regarded as a good species, since it is only known from Italy, and no brachypterous specimen of the much-examined *F. auricularia* has ever been recorded from any other country, at least to my knowledge. In the structure of the body, coloration (a quite unimportant feature), and armature of the forceps, *F. silana* is otherwise indistinguishable from the common earwig.

Now when collecting at Compton Bay, in the Isle of Wight, in the summer of 1903, I took, among a lot of ordinary *F. auricularia* crawling in a heap of cowdung, two females with aborted wings: it seems necessary therefore to refer them to *F. silana*, hitherto regarded as a rare species confined to Italy.

The true explanation is probably that we have here the same dimorphism occurring sporadically in the common earwig, and that for some reason it is a more frequent phenomenon in Italy than elsewhere.

It is highly desirable that more material be obtained, and I hope and trust collectors will keep a sharp eye open in this country, and on the Continent, for specimens of the common earwig having reduced wings.

There is another possible, but improbable, explanation.

There is in the Mediterranean province another pair of species, which stand in the same relation to each other as *F. auricularia* and *F. silana*: these are *F. decipiens*, Gén  , and *F. lurida*, Fischer. They both differ from *F. auricularia* and *F. silana* in the absence of the strong tooth at the end of the dilation of the male forceps. *F. decipiens* is brachypterous, and ranges in the western Mediterranean lands; *F. lurida* is macropterous, and occurs throughout the Levant.

The females of these four species are practically indistinguishable, so there is the possibility that these two females of mine may be referable to *F. decipiens*. But as that is a purely meridional species, this is very improbable. The discovery of the male would at once settle the question.

I called attention to this interesting problem in the Ent. Mo. Mag. 1907, p. 173, hoping that it would stimulate search, but the enquiry has produced no results.

May I appeal to Coleopterists, Hemipterists, and other collectors who use the sweep-net, to look out for brachypterous specimens of the common earwig and to send them to me?

Dover: January, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

BY E. H. STRICKLAND (Dip. S.E.A.C.).

(Continued from p. 182.)

Culicada inornata, n. sp.

Thorax dark brown, clothed with golden brown scales, on the posterior half are two lateral lines of whitish scales, spreading from the white pre-scutellar patch. Scutellum white scaled. Abdomen black, scaled with indistinct white lateral spots, and basal bands on some of the segments. Tarsi with poorly defined yellowish white basal bands.

♀. Head black, clothed with rather dull yellow narrow curved scales, and similarly coloured upright forked scales at the back and middle area of the head, which appear to be black in certain lights. The lateral flat scales are white. A few golden yellow bristles project between the eyes. There is a narrow margin of more white-coloured scales bordering the eyes. Eyes bronzy. Palpi with white scales at the apex, remainder dark scaled with a few white scales scattered over the upper surface. Clypeus black. Antennæ with basal joint mainly dark with a few white scales. Second and third joints mainly testaceous. Proboscis rather short. Thorax dark brown, clothed with dull golden brown scales. On the posterior half are two indistinct curved lateral lines of paler scales. The scales before the scutellum are whitish. Scutellum clothed with white narrow curved scales. Prothoracic lobes and pleuræ with white scales. Abdomen black, scaled with traces of dull white basal bands forming a median patch on all segments. There are small irregular lateral dull white spots on some of the segments. The ventral surface is clothed with white scales. The femora and tibiæ are spotted, the former are mostly white scaled below. Knee spots yellow. Tibiæ unbanded. Tarsi not very definitely banded with narrow yellowish-white bands. Fore and mid legs with apical tarsus unbanded. Hind legs with all tarsi banded, though the bands on the metatarsus and apical tarsal are very rudimentary and incomplete.

Wings not very densely scaled, the first fork cell is longer and narrower than the second posterior cell. Its stem is about half the length of the cell. The supernumerary and mid cross-veins are nearly in line, the former being slightly nearer to the wing base. The posterior cross-vein is rather less than its own length distant from the mid cross-vein. Halteres with light stems and blackish knobs.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from two rather damaged females.

It is apparently a true *Culicada*, the palpi being much longer than those one usually finds in *Culex*.

Culicada demansis, n. sp.

Thorax deep brown, with uniform golden brown scales. Scutellum with creamy scales. Abdomen black with dull white incomplete basal bands on all, and lateral white spots on some of the segments. Tarsal bands white, very broad on the hind tarsi, which character at once distinguishes this species.

♀. Head black. The narrow curved and lateral flat scales are creamy yellow, and the rather sparse upright forked scales at the back of the head are black. The palpi are long, clothed with black scales except for the white apex, and a few white scales at the junction between the second and third segments, and the junction between the first and second segments. Proboscis entirely dark scaled. Antennæ black, the basal segment is dark brown and only a little lighter in colour than the remaining segments.

Thorax deep brown, with uniform golden brown scales, which are perhaps a little darker laterally: just behind the prothoracic lobes are a few creamy narrow curved scales. Prothoracic lobes and scutellum with creamy narrow curved scales. Pleuræ with creamy scales. Abdomen black with dull white incomplete basal bands on all segments, none of which reach the lateral margins where, however, in some segments there is a small whitish lateral spot. Ventral surface with dull white scales, and a few scattered darker scales. Femora and tibiæ light testaceous. Femora light scaled below, except for apical third, and dark scaled elsewhere with a few scattered whitish scales. Knee spot ochreous. Tibiæ unbanded. Tarsi with broad white bands, all apical tarsi unbanded; fore and mid legs with fourth tarsi also unbanded. Banding very deep on hind legs.

Wings rather densely clothed with dark brown scales. The first fork cell is longer, but narrower than the second posterior cell, its stem is over half the length of the cell. The supernumerary and mid cross-veins form a straight line with each other. The posterior cross-vein is about its own length distant from the mid cross-vein. Halteres, light stems and knobs.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from one rather damaged female.

As only one specimen was sent, the unguis could not be well examined, so the relationship of this species to others of the genus *Culicada* cannot at present be determined.

Culicada vandema, n. sp.

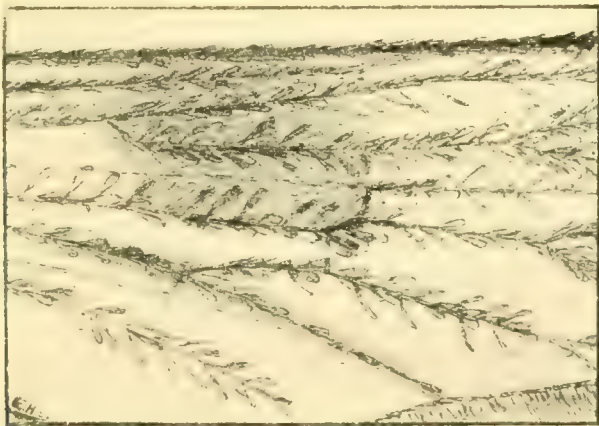
This species varies very much in thoracic scale ornamentation, from uniform dark brown scales to a variety which possesses many golden scales, especially on the median area. Abdomen unbanded, but with ochreous lateral spots on some segments. Legs testaceous with yellowish tarsal bands. The distinctive character of this species is a large dark area in the centre of the wing.

♀. Head black on the vertex and yellow at the sides and back. The narrow curved scales are uniform in size and of a light golden colour. The upright forked scales are all black, and the lateral flat

scales are of an ochreous tint. The basal antennal segment, together with the greater part of the second segment, is testaceous. Clypeus testaceous. Palpi dark scaled, somewhat lighter below. Proboscis dark scaled with scattered lighter more yellowish scales.

Thorax dark brown, sometimes with a lighter median band, and lighter basal lateral patches. The scales are uniformly dark brown; some specimens, however, have a few scattered golden scales. Scutellum with light yellow narrow curved scales. Abdomen black scaled on the basal segments gradually giving place to dull ochreous scales on the apical segments. None of the segments are banded, but dull ochreous lateral spots are present on some of the segments. Ventral surface dark scaled with a few scattered ochreous scales. Femora all mottled, but are mainly dark above and light below. Tibiæ dark scaled with a few ochreous scattered scales. Tarsi with yellow basal bands.

Wings with a dark brown cloud extending from the costa to the fourth longitudinal vein in the one direction, and from the base of the second longitudinal forward to the supernumerary and mid cross-veins in the other direction. There is also another slight cloud along the



Portion of wing of *Culicada vandema*, n. sp., showing mottled scales and the clouded patches.

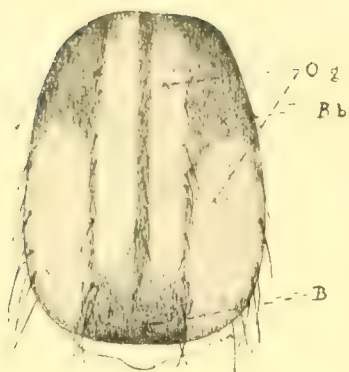
fifth longitudinal vein which follows the lower branch of the fork. The supernumerary and mid cross-veins are almost in a line with each other, and the hind cross-vein is not quite its own length distant from the mid cross-vein. First fork cell narrower and a little longer than the second posterior, its stem is not half the length of the cell. The scales are rather dense, and are mottled dark brown and yellow. Halteres, light ochreous stems and knobs.

Length 5.5–6 mm.

Habitat.—Tasmania.

Observations.—Described from five female specimens.

This is a very distinctive species owing to the dark cloud on the wings which is very clearly defined. The species itself, however, appears to be subject to much variation in thoracic adornment, as all the five species varied from each other in this respect. A description of a marked variety is appended.

Culicada vandema var. *variegatans*.

Thorax of *Culicada vandema*
var. *variegatans*.

O.g. — Deep orange. Golden scales.

B.b. = Dark brown. Brown scales.

B = Dark brown. No brown scales.

♀. This variety is true to the description of *C. vandema* given above in all respects, with the exception of the thoracic ornamentations.

The thorax is for the greater part of an orange brown colour. There is a deep brown median line which terminates in the pre-scutellar area, which is also dark brown and devoid of scales. On either side of this area a narrow line runs forward, parallel with the dark median line to dark lateral patches which occur on the apical third of the thorax, as shown in the diagram. The narrow curved scales are of a bright golden colour all over, with the exception of over the dark lateral patches, where they are replaced by dark brown scales.

Observations.—Described from a single female.

The other specimens which varied from the typical description appeared to be intermediate stages between the type and this variety, but in none of them were the golden coloured scales on the thorax much in evidence.

(To be continued.)

NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 176.)

Thosea castanea, sp. n.

Reddish brown. Fore wings silky, rather darker towards the base; a darker, diffuse, slightly sinuous band from costa near apex to outer margin at vein two.

Expanse, 23–25 millim.

Collection number, 738.

Two male specimens from Kanshirei (1000 ft.), July 24th, 1906.

Narosa nigrisigna, sp. n.

♀. Fore wings white, sprinkled with ochreous brown on basal and inner marginal areas, clouded with darker ochreous brown on medial and outer areas; some black scales at end of cell, and a black sinuous line beyond; a marginal series of black dots. Hind wings whitish, thickly sprinkled with ochreous brown.

Expanse, 21 millim.

Collection number, 608.

Two female specimens from Kanshirei (1000 ft.) ; one August, 1907, the other October, 1908.

Narosa corusca, sp. n.

♂. Fore wings yellowish white, mottled and streaked with pale reddish brown, the latter most in evidence between the veins; post-medial line darker reddish brown, sharply angled above the middle, thence wavy to inner margin; a darker reddish brown spot at end of cell; a series of black dots on the outer margin, one between veins two and three largest; fringes with a darker central line. Hind wings yellowish white, fringes paler. Under side yellowish, veins and fringes whitish.

♀. Similar to the male, but the space between end of cell and postmedial line is filled up with the darker reddish brown colour; some blackish dots on the postmedial line at angle and below; the black dot between veins two and three is rather larger than in the male, and between it and the dot at angle of the line is an intermediate dot.

Expanse, 27 millim.

Collection number, 61.

One example of each sex from Kanshirei (1000 ft.) ; the male captured in May, 1907, and the female in May, 1908.

Allied to *N. fulgens*, Leech, from Gensan and Ningpo.

Natada furva, sp. n.

Head, thorax, and abdomen pale brownish. Fore wings pale brown, freckled with darker; a diffuse patch of blackish scales in the cell, and an elongate one below it extending to the inner margin; traces of a dusky submarginal line. Hind wings and under side of all the wings fuscous.

Expanse, 19 millim.

Collection number, 676.

Two male specimens from Kanshirei (1000 ft.), August 20th, 1905.

The second specimen is in poor condition, but it has a distinct black spot at end of cell, of which there are only faint traces in the type specimen described; black scales are not present in cell, and the patch of black scales near inner margin is very much reduced.

Tetraphleps (?) *rugosa*, sp. n.

♂. Head and thorax chestnut-brown, patagia blackish brown; abdomen dark brown, basal segments chestnut-brown above. Fore wings blackish, rather glossy, but with a rough and crumpled appearance; the costa is brown from middle to apex, and there are three brown clouds—one at lower angle of cell, one between this and inner margin, and a larger one before the outer margin. Hind wings and the under side of all the wings, fuliginous.

Expanse, 34 millim.

Collection number, 736.

One male specimen from Kanshirei (1000 ft.), July 18th, 1908.

Miresa vulpina, sp. n.

♂. Head and thorax bright reddish brown, abdomen rather duller. Fore wings reddish brown, flecked with glossy whitish scales; postmedial line blackish, incurved before the inner margin. Hind wings paler.

Expanse, 42 millim.

Collection number, 726.

One male specimen from Kanshirei (1000 ft.), June 17th, 1908.

Near *M. inornata*, Walk.

(To be continued.)

ICHNEUMONIDÆ TAKEN IN CORNWALL, 1910.

BY W. A. ROLLASON, F.E.S.

IN contributing this report of my past season's captures, I have first to deplore, in common with most brother entomologists I presume, the extremely bad climatic conditions which prevailed throughout the year, and with such short periods of what the entomologist would call favourable weather for collecting. Following as it did the bad season of 1909, it proved particularly disastrous for Lepidoptera; consequently I was rather agreeably surprised to find ichneumons almost as plentiful as in the previous year, when I took nearly two hundred and thirty insects, the more important species of which I recorded in last year's volume of this Journal (pp. 53 and 54); this year my total was about one hundred and seventy, the decrease being due to absence from the county for a fortnight and a further period of nearly three weeks, when the pressure of some special work prevented my taking any excursions. I have again to express my indebtedness to Mr. Claude Morley, F.E.S., F.Z.S., for the encouragement and generous assistance he has rendered in the determination of all the following species, the record of which will, I trust, prove of interest and value:—

NINE SPECIES NEW TO CORNWALL.

Barichneumon lepidus, Grav.—One male, July 2nd, near Scawswater; one male, September 12th, Lizard district.

Microcryptus sericans, Grav.—One male, July 2nd, near Truro; there is no British record instanced in Morley's vol. ii., but in MS. from him, dated November 21st, 1910, he says, "I have now a single male from Scotland." [There are two males in Mus. Brit. from Bugbrooke, in Northants (Marshall), and Stephens's coll.—C. M.]

Panargyrops pellucidator, Grav.—One male, June 4th, Devoran.

Pycnocryptus peregrinator, Linn.—Three males and two females, July 8th and 9th, near Scawswater and Calenick, on *Heracleum* flowers.

Cryptopimpla errabunda, Grav.—One male, June 26th, Truro; one female, September 9th, Lizard district. This is a very rare insect; Morley, in his vol. iii., gives only three records for Britain.

Bassus dimidiatus, Schr.—One female, July 10th, Truro.

Polyclistus (Exochus) mansuetor, Grav.—One, September 5th, Carnon Croft.

Erigorgus melanobatus, Grav.—Five males, April 30th, one female, May 21st, north coast.

Olesicampa fulviventris, Grav.—One female, May 16th, near Falmouth.

ONE VARIETY NEW TO CORNWALL.

Meniscus pimptator, Zett.—One male variety, September 30th, near Truro.

The following list of twenty-six species gives my further captures, which species, although having previously been recorded, have not in some instances been reported with data for many years:—

Cælichneumon lineator, Fab.—One male, July 23rd, Calenick.

Melanichneumon leucomelas, Gmel.—One female, September 27th, Truro, walking on footpath of a street in the city.

Barichneumon albicinctus, Grav.—One female, July 8th, near Scawswater, on *Heracleum* flower.

Ichneumon terminatorius, Grav.—One female, September 5th, Lizard district, on *Angelica* flower.

I. confusorius, Grav.—One female, April 20th, Truro, at rest on a stone in garden; one female, May 16th, near Feock, on *Umbellifera* flower.

Exephanes hilaris, Grav.—One female, May 16th, near Feock, on *Umbellifera* flower. (An uncommon insect.)

Chasmias motatorius, Fab.—One male, September 5th, Carnon Croft, on *Angelica* flower; three males, September 9th, 10th, and 13th, Lizard district.

Amblyteles armatorius, Forst.—One male, July 10th, Truro.

Probolus alticola Grav.—One male, September 1st, bred from a wild Truro pupa, species unknown. (An uncommon insect.)

Eurylabus tristis, Grav.—One male, July 8th, near Scawswater, on *Heracleum* flower; one female, July 9th, Truro, on leaves of *Amaryllis fulva* in garden.

Platylabus pedatorius, Fab.—One male, June 17th, Calenick.

Cryptus albatorius, Vill.—Four males, June 3rd, 4th, and 17th, Calenick and Devoran.

Perithous mediator, Fab.—Two males, September 14th, Lizard district.

P. divinator, Rossi.—One female, September 14th, Lizard district.

Pimpla ruficollis, Grav.—One female, May 13th, Truro; a rare insect, only once previously recorded for Cornwall (Land's End district), and seven records only for Britain; see Morley's vol. iii.

P. nucum, Ratz.—One female, July 8th, near Scawswater, on *Heracleum* flower.

P. oculatoria, Fab.—One female, July 8th, near Scawswater, on *Heracleum* flower.

Clistopyga incitator, Fab.—One male, June 26th, one female, June 27th, Truro.

Glypta monocerus, Grav.—One male, July 2nd, near Idless, on *Heracleum* flower.

G. sculpturata, Grav.—One female, September 5th, Carnon Croft.

G. bifoceolata, Grav.—One male, July 23rd, Truro, on *Heracleum* flower.

Meniscus murinus, Grav.—One male, May 16th, near Feock; one male, May 24th, Truro; one male, June 3rd, Calenick.

Phytodietus coryphæus, Grav.—One female, June 17th, Calenick.

Banchus pictus, Fab.—One male, July 8th, near Scawswater, on *Heracleum* flower.

Polyblastus variitarsus, Grav.—Two males, June 17th, Calenick.

Campoplex falcator, Thunb.—One female, July 9th, Calenick, on *Heracleum* flower.

A considerable number of my captures for 1909 and 1910 are as yet undetermined by Mr. Morley, amongst them being a few Braconidæ.

The following species I recorded as "new to Cornwall" in 'Entomologist,' vol. xliii. p. 53, 1910, and have again taken this year:—*Microcryptus abominator*, Grav., *Idiolispa analis*, Grav., *Pimpla robusta*, Morl., *Stilbops chrysostoma*, Grav.

"Lamorna," Truro: February 13th, 1911.

NOTES ON BRITISH ORTHOPTERA IN 1910.

BY W. J. LUCAS, B.A., F.E.S.

Forficulodea.—On August 10th I visited one of the localities for *Labidura riparia* on the shore in the Bournemouth district, accompanied by Mr. J. J. F. X. King, who wished to see the insect at home. The earwigs seemed to be scarce on that occasion, and we secured only four between us—two rather small male imagines, a female imago, and a very small nymph. One of the males had lost a wing, or at any rate the exposed part of it; the elytron, however, was present. *Forficula auricularia* is reported as ubiquitous in Linlithgowshire (S. E. Brock). A very large var. *forcipata* was taken on July 26th, by Mr. P. M. Bright, on the cliffs at Freshwater, in the Isle of Wight, and given to Mr. King. The length of the insect was 25 millimeters, 10 mm. of which were due to the callipers. These were so long that Mr. King at first took the insect for a specimen of *Labidura riparia*, which has been reported from the island, though I believe it is a long time since it has been found there. When the earwig was etherised, two dipterous larvæ belonging to the Muscidæ emerged, each about 6.25 millimeters in length. As I had not a lens with me in the New Forest suitable for making an enlarged

photograph, Mr. G. T. Lyle was kind enough to take and give to me a negative of the insect ($\times 24$) which is here reproduced.*



Mr. J. J. Walker (*in litt.* November 9th, 1910) informed me that he had twice taken *Forficula lesnei* singly during 1910, at Cothill, near Abingdon, in Berkshire, on September 18th and 20th respectively. [Writing later he stated that on October 3rd, 1907, he took a female by sweeping on Merrow Downs, between Guildford and Newlands Corner, Surrey.]

Blattodea.—*Ectobius lapponicus* was taken near Ramnor, in the New Forest, on August 9th. At Holm Hill, in the New Forest, on August 21st, when breaking up and examining the trunk of a small dead burnt pine, I met with two or three specimens of *Ectobius panzeri*. At the same time a *Scolopendra* (centipede) was captured, holding one of these cockroaches, which apparently it had just caught. Though not dead, the cockroach moved but little; possibly the centipede may have paralysed it, but that I cannot say. While I watched, the centipede seemed to be using its poison-jaws much as if they were legs. The cockroach was held beneath the captor's body by several of the anterior pairs of legs, ventral surface upwards; I

* It will probably be noticed that the insect when photographed was in a slightly damaged condition as regards head and thorax.

presume in order that the softer parts of the prey might more easily be devoured. The centipede seemed distressed because it could not hide, but nevertheless fed greedily on the cockroach, sometimes waving its antennæ vigorously. The centipede was livid pink in colour, a rather small species, or perhaps the young of a larger kind. In the insect-house at the Zoological Gardens, Regent's Park, on October 23rd, numbers of large cockroaches, apparently *Periplaneta americana*, were continually emerging from the grating over the hot-water pipes. They ate readily some sugar put down for them.

Gryllodea.—Early in the year Mr. G. T. Lyle sent me alive three specimens of the New Forest cricket (*Nemobius sylvestris*), which he had found crawling and hopping about on fallen sweet-chestnut leaves in the New Forest, on February 12th, 1910. Two were small, but the third, a female, appeared to be full-grown. Of the small ones he saw great numbers, but he met with only the single large specimen. So early a date for an imago is important.

Locustodea.—A specimen of *Phasgonura viridissima* from Ranmore, Surrey, on August 13th, has already been referred to in these pages. A female nymph of the same species, sent to me by Mr. G. T. Lyle from Beer, Devon, on July 27th, shortly after its arrival underwent its last change and became a crippled imago. With it was also sent a nymph of *Pholidoptera griseoaptera* (= *cinereus*). An example of the last species, taken at Yarmouth, in the Isle of Wight, in August, was shown to me by Mr. E. A. C. Stowell. On September 2nd a male was captured at Fordingbridge, in Hampshire. Mr. J. G. Dalgliesh tells me that he took an example of the interesting species *Conocephalus dorsalis*, near Witley, in Surrey.

Acridiodea.—In this group also I have little to note except the addition of a few dated localities to the list. *Gomphocerus maculatus* is locally common in Linlithgowshire, the earliest date on which it has been heard being July 4th (S. E. Brock). Other localities are Lumphanan, in Scotland, July 15th–31st (K. J. Morton), Yarmouth, Isle of Wight, August 11th (W. J. L.), and near Oxshott, Surrey, on September 13th (W. J. L.). *Omocestus viridulus* is common and generally distributed throughout suitable localities in Linlithgowshire, the earliest date on which it has been heard being June 29th (S. E. B.). It is also recorded from Lumphanan, July 15th–31st (K. J. M.); Hengistbury Head, Hants, August 5th (W. J. L.); and Yarmouth, Isle of Wight, August 11th (W. J. L.). *Stauroderus bicolor*: Yarmouth, Isle of Wight, August 11th (W. J. L.); Hayling Island, Hants, in August (D. Sharp); near Oxshott, Surrey, September 13th (W. J. L.); and a good number on the links north of Tyne-mouth, Haddingtonshire, on October 1st (W. Evans). *Chor-*

thipphus parallelus: Lumphanan, July 15th–31st (K. J. M.); Beer, July 27th (G. T. Lyle); Hengistbury Head, Hants, August 10th (W. J. L.), and Yarmouth, Isle of Wight, August 11th (W. J. L.) On September 4th I visited Silverstream Bog, in the New Forest, for *Mecostethus grossus*. They were not much in evidence, although there was a good amount of sunshine; but the wind was cool. Some six or eight were seen and five were captured—four males and one female. A male and a female, kept alive, were taken to Kingston-on-Thames on September 10th, and there placed in a large fish-globe containing *Sphagnum* and a tuft of grass, the top of the globe being covered with muslin. One was noticed eating the grass, holding the blade with its fore-legs in a very “human” manner, in order to bite along the edge. They were seen paired more than once. The male was dead on September 18th, while the female succumbed about September 26th, the latter having eaten much grass a few days before. *Tetrix bipunctatus* occurred at Box Hill, Surrey, on July 2nd. On August 1st, at a damp spot in a ride of Vinney Ridge Inclosure, in the New Forest, where grass was luxuriant, a number of grasshoppers were found dead, but holding to the grass as if simply resting there. Perhaps all were *O. viridulus*. In some cases the abdomens seemed unduly distended, but there was no obvious cause of death.

Kingston-on-Thames: May, 1911.

SOME ICHNEUMONIDOUS SYNONYMS.

BY CLAUDE MORLEY, F.Z.S.

CLEARING up synonymy is one of the most beneficial points in the present study of Ichneumonidæ and, though difficult and often dangerous in the absence of type-specimens, it is rendered comparatively easy when one or other of specimens described is before one. I have found in the British Museum all the types of the eight kinds shortly diagnosed by T. V. Wollaston in Ann. Nat. Hist. 1858 (ser. iii. vol. i. pp. 21–23). None of them have been mentioned in literature since first brought forward, and they have been nothing but a cumbrance to the monographer. They were doubtless examined by Francis Walker, who has placed many manuscript names upon other insects in the same collection, regarded as new by him. As far as my knowledge extends, the synonymy of those published should stand thus: (1) *Picrostigeus* (*Orthocentrus*) *anomalus*, Holmgr. Sv. Ak. Handl. 1855, p. 351, male = *Misoleptus* (sic) *maderensis*, Woll. l. c. 21, pl. iv. fig. 1. (2) *Phygadeuon vagans*, Grav. Ichn. Europ. ii. (1829), 738, female = *Hemiteles postica*, Woll. l. c. p. 22. (3) *Exetastes peregrinus*, Woll. l. c. p. 22, pl. iv. fig. 2,

male (sic) = *Campoplex angustatus*, Thoms. Opusc. Ent. xi. (1887), 1061, female. (4) *Ephialtes lateralis*, Woll. l. c. p. 22, female, I regard as a good species, though extremely closely allied to *E. ruficollis*, Desv., and most probably nothing more than a meridional form of it, with terebra variable in length and not always as long as the body, the outline stouter and thorax darker. (5) *E. lineatus* Woll. l. c. p. 22, female, is also a good species belonging rather to *Exeristes* than to *Ephialtes*; in the two co-types the terebra is nearly as long as the body. (6) *Ephialtes linearis*, Woll. l. c. p. 22, male and female, is a *Clistopyga* unknown to me, but possibly *C. erythræa* or *C. rufescens*, Fonsc. Ann. Soc. France, 1854; p. 518; Walker regarded the female as *Perithous mediator*! (7) *Lissonota dorsalis*, Woll. l. c. p. 23, male, nec Grav. et Fonsc. is a *Pimpla* sensu Thoms., represented by one of each sex. (8) *Bassus alborarius*, Woll. l. c. p. 23, is a small and dark *B. letatorius*, F., a common species in Madeira, the Ichneumon fauna of which appears to be distinctly Palæarctic rather than African.

Cryptus pulcherrimus, Kirby [Bull. Liverpool Mus. iii. (1900), p. 14 et the Nat. Hist. of Sokotra and Abd-el-Kuri, by H. O. Forbes, 1903, p. 237], belongs to the genus *Acroricnus*, Ratz.; both sexes, including the typical female, are in Mus. Brit.

Amblyteles ludovicus, Cameron, from Yatsurhiro, in Japan (Trans. Nat. Hist. Soc. Glasgow, 1883, p. 272), is a female *Melanichneumon leucomelas*, Gmel., with European examples of which it agrees *ad amussim*. *Hoplismenus mikado*, Cam. (lib. cit. 1885-6, p. 274), from Kobe = *Trogus lutorius*, F., male, differing from the usual form only in its basally black second and third segments. *Callojoppa bilineata*, Cam., from Japan = *Trogus exaltatorius*, Panz., female. *Colpognathus magellansis*, Cam. (Proc. Manchester Soc. 1888, p. 129) is a female *Cryptus* (sensu Thoms.) with exserted terebra and strong mesopleural sulci.

Eight new species are brought forward by A. H. Haliday in "Description, &c., of the Insects collected by Captain P. P. King, R.N., F.R.S., in the Survey of the Straits of Magellan" (Trans. Linn. Soc. 1836, pp. 316-19), all of which are, of course, new, and I have examined the types in Mus. Brit. (1) *Ichneumon xanthorrhæus*, Hal., is a male *Platylabus*. (2) *I. plebeius*, Hal., male, is extremely like, though distinct from, *Ctenichneumon melanocastanus*, Grav. (3) *I. patricius*, Hal. (male, sic) is a female *Amblyteles*. (4) *Phygadeuon prælatus*, Hal. (male, sic) is a female *Ctenichneumon* with metallic blue body. (5) *Trachysphyrus imperialis*, Hal., female, a splendid metallic purple insect, which also occurs in Chili and is probably re-described in Claudio Gay's 'La Historia Fisica y Politica de Chile'—in Spanish—vol. vi.; the flagellum is entirely black, filiform, and extends to apex of basal segment. (6) *Cryptus bellicosus*, Hal., female = *C. nitidipennis*, Brullé, Hym. iv. (1846), 188; I have

seen it from Valdivia (Walker), Temuco, Jan. 1906 (Middleton); Terra del Fuego, Dec. 1904, several (Crawshay);* Santiago (Rees), and Patagonia (Chubut). (7) *Pimpla sponso*, Hal., is a female *Itopectis*. (8) *Campoplex fugitivus*, Hal., is a *Limnerium* sensu lato, and single male and female are correctly associated. The *Chrysis* there named *C. cærulans*, F., which seems not to extend south of Guatemala, is much more closely allied to *Tetrachrysis carinata*, Spin. The specimen of *Ophion luteus*, Linn., that Haliday records thence is correctly named.

Many of the genera, ascribed to his species by Cameron in 'Biologia Centrali-Americana,' vol. i. pp. 135 (1884)–312 (1886), are incorrect, and some of the Mesolepti are referable to Lissonotini; but it is too long a task to touch here, and I will only say that a somewhat small proportion of the types are not in Mus. Brit., being either lost or in the Vienna Museum, where I believe all Bilimek's collection is to be sought.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. DISTANT.

Fam. BERYTIDÆ.

Capys gracilis, sp. n.

♂. Head ochraceous, the lateral margins behind eyes and a somewhat circular series of coarse black punctures at base, enclosing ocelli, black; pronotum with the anterior area ochraceous, remainder thickly blackly punctate with the margins and a central line ochraceous, scutellum blackly punctate; corium ochraceous, thickly finely blackly punctate; membrane greyish brown with scattered blackish markings; connexivum ochraceous with elongate black spots; body beneath black, abdomen with lateral marginal elongate ochraceous spots, coxæ ochraceous; antennæ with the first and second joints ochraceous finely speckled with black, fourth joint black, first joint more than twice as long as second, subequal in length to third, apex of first joint distinctly incrassate, fourth short and moderately thickened; head between antennæ armed with a moderately long curved spiniform porrect process; pronotum longer than broad, elongate, only moderately widened posteriorly; membrane reaching apex of abdomen; rostrum about reaching the posterior coxæ, its apical joint black.

♀. Abdomen beneath testaceous; membrane not reaching apex of abdomen. $6\frac{1}{2}$ to 7 millim.

Hab. Trichinopoly.

Differs from *C. malacipus*, Stål, by the slightly shorter and somewhat more robust spiniform process to the head, the narrower pronotum, and the shorter and more thickened apical joint to the antennæ. Dr. Montandon kindly forwarded me this species.

* Dalla Torre's reference to Dr. Thwaites (Tr. Ent. Soc. 1845. Proc. lvii.) is incorrect, and refers to *Cryptus bellosus*, Curt. (*Aritanis signatorius*, Fab.).

Some amount of conjecture has been formulated by Bergroth in relation to the generic name *Capys* as here used. In 1907 Breddin proposed a new genus *Capyella*, which Bergroth correctly surmised was only a synonym of *Capys*, Stål (1865). The name *Capys*, however, was also used in the same year by Hewitson for a genus of Lycænidae. Bergroth states that Hewitson's name was published a little earlier than Stål's and that, therefore, *Capyella*, Bredd., could be used as a new name, but he does not give us any particulars as to the respective dates of publication, though probably he has some information that is neither known in Stockholm or London where these names were founded, and where I have sought—unsuccessfully—to discover exact dates of publication beyond that of the same year. I therefore do not consider that Bergroth at present is quite justified in this alteration, and I do not follow him.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

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(Continued from p. 169.)

THE Adephaga, Phytophaga, and, with some exceptions, the Lamellicornia also possess only one pair of these accessory glands. In the Phytophaga they are often bifurcate and sometimes look like two pairs, as, for example, in *Prionus* (fig. 7). Two or three pairs are usually met with in other groups. Their division into *ectadenia* and *mesadenia* seems to be purely theoretical and not yet confirmed by a study of their development; and I notice that whereas Ganglbauer classes the single pair in each of the three groups mentioned as *ectadenia*, Berlese, in his admirable work 'Gli Insetti,' describes those of the Lamellicorns and Phytophaga as *mesadenia*. Dr. Bordas, in adopting the names given by Escherisch, is careful to dissociate himself from any acceptance of the views implied as to the origin of the glands in each particular case. He himself suggests that those of the Longicornia would be more correctly described as *mesadenia*.

The Malpighian Vessels.—The importance of these in the classification of the Coleoptera depends upon their number and the view we take as to which is the more primitive number. In beetles they are always few in number, either four or six. The Adephaga, Staphylinioidea, and Lamellicornia have only four; the Heteromera, with some exceptions met with in the Meloidæ,

the Phytophaga, and the Rhynchophora have six. The number varies in the other large groups, being usually four in the lower forms, such as the Malacodermes, and six in the higher and more specialized forms. So that, notwithstanding Wheeler's view that six was the primitive number of the nephridial vessels not only in Coleoptera but in all insects, it would seem that in the Coleoptera, at least, the tetranephric condition is more primitive than the hexanephric. Brauer believed that the primitive insect had only two pairs of nephridial ducts. Wheeler has brought forward many facts in support of his own view, but there are others which tell against it, and, on the whole, I think it is safe to conclude that the tetranephric Coleoptera are generally more primitive than those in which the hexanephric condition prevails.

The Nervous System.—As a result of the researches of Blanchard, Brandt, and other anatomists, the condition of the nervous system in many families of beetles is now fairly well known. The differences found in it relate mainly to the greater or less concentration of the ganglia in the ventral chain. It may be assumed as true that the greater the concentration of the ganglionic chain, the higher is the stage of development proceeding along the same line. This consideration has greatly influenced Ganglbauer in his arrangement of the family series, and of the different families in each series. The Rhynchophora show throughout a relatively very high concentration of the ganglionic chain; the Anthribidæ, which he considers to be the lowest and least differentiated of the families, being inferior to none of the others in this respect. The Scolytidæ, in which the concentration is greatest, he places chiefly for that reason at the end of the series. The Rhynchophora he considers to be of later origin than the Phytophaga, and doubtless derived from them, probably through the Bruchidæ, in which already there was shown a rather strongly concentrated nervous system.

The high degree of concentration of the nerve ganglia met with in all the Lamellicornia, except the Lucanidæ, seems to have been one of the chief factors in determining him to place the Lamellicornia as the highest and last group of all.

But the concentration of the ganglia of the ventral chain seems to be correlated with a general shortening of the body, especially of the hind body; so that it probably does, as Kolbe maintains, follow, merely as a consequence, the concentration of the body by a fusion of its segments and parts with one another.

External Morphology.—The characters so far considered are, with the exception of the wing-venation, somewhat outside the field of the ordinary systematist. But the characters with which he has mostly to deal—those derived from a study of the external form and structure of the body and its appendages—are scarcely

less important and have by no means been neglected in our latest classifications.

In fact, the characters to be obtained from a study of the external form and structure of the body should, in Kolbe's opinion, outweigh all others, such as those derived from the internal organs or from the structure of the various appendages—wings, legs, antennæ, &c. In the head, its modifications of form, the presence or not of a distinct labrum, and the coalescence or otherwise of the gular sutures; in the prothorax, the extent to which, if any, fusion has taken place in its skeletal parts, the pleuræ with one another or with the notum or sternum; in the abdomen, the number of the segments, and, especially, the separation or fusion with one another of the sternites and pleuræ of the basal segments—these are the characters which have for Kolbe the greatest morphological and phylogenetic value. The chief direction of evolution in the Coleoptera has been towards a fusion of the basal sternites and pleuræ of the abdomen, and also of the skeletal parts of the head and thorax; this is, I think, a fair statement of the leading principle in his classification.

It can hardly be denied that that is one direction, and a very important direction, in which evolution has gone on in the Coleoptera; but it has proceeded also in many other directions; effecting changes in the structure of the wings, legs, and other appendages, no less than in the body itself, and every character has its value in phylogeny if it enables us to postulate of such or such a form that it cannot have been derived from such another. There are many characters of this kind to be met with in the Coleoptera, especially if the law be true that an organ or structure having once disappeared in the course of evolution will never again reappear. The application of this law, enunciated, as he says, by Meyrick, plays an important part in the phylogenetic speculations of Lameere, and there is little doubt that it can, if used with care, be made to yield very good results. It seems to me a safer method than that of considering one set of characters all-important.

The Rhynchophora are characterized, as a whole, not only by the great concentration of the ganglionic chain but also by the great extent to which fusion of the exoskeletal parts has taken place, and the great modification in form undergone by the head. Kolbe considers them, therefore, not only as a distinct group, but as the most highly organized of all the Coleoptera, and places them last in his classification.

But he has, I think, rather over-emphasized the distinctness of the group, and the extent to which fusion of the parts of the body has taken place.

Ganglbauer has pointed out that of all the characters assigned by Kolbe to the Rhynchophora, only two—the coales-

cence of the gular sutures and the disappearance of the sutures between the pleuræ and the sternum and notum of the prothorax—are characteristic of the group as a whole and confined to that group. But even as regards those two characters there are exceptions within the group. From my own observations I find that the gular sutures are quite distinct and as wide apart in the Oxycorinidæ as they are in many families outside the group; they are rather widely separated also in the genus *Rhinomacer*; and again in some Platypodinæ, as for example, *Crossotarsus*, they are, though strongly convergent behind, quite separate right up to the hind margin of the head. It is just possible that the absence of the gular sutures in many other Rhynchophora is not always, as is assumed to be the case, the result of their coalescence first and disappearance afterwards, but may sometimes be due directly to the strong chitinization of the integument, which is so general in this group. The disappearance of the prothoracic sutures admits to some extent of a similar explanation, although here it is only in the disappearance of the suture between the sternum and the pleuræ that they differ from most of the other Coleoptera, and even of this suture there are distinct traces left behind in many of the Rhynchophora. The suture between the notum and the pleuræ has altogether vanished, but so it has also in all the Polyphaga, and this character can only be used to distinguish them from the Adephaga, perhaps not even from all of these.

No one has yet suggested that the Paussidæ should rank as the highest of all the Coleoptera; their adephagous affinities are too apparent for that. Yet in this family we find the basal sternites of the abdomen fused together, the nervous system concentrated, and, in some of the genera, the sutures of the prothorax almost completely vanished, and the epimera meeting together behind the prosternal process. If we had the external morphology of the body alone to guide us, how should we be enabled to say that the genus *Paussus* belongs to the lowest and most primitive of all the groups of Coleoptera? That conclusion was arrived at first by a study of its wing-venation, and has since been confirmed by a knowledge of the structure of the sexual organs. External morphology does also, it is true, bear it out, for in the lower genera of the family there is, I find, a quite distinct suture between the pleuræ and the notum resembling completely the one met with in all other families of Adephaga.

That the Rhynchophora are a very highly organized and greatly modified group of the Coleoptera no one now seems to question; but their position in a phylogenetic scheme of classification depends not so much upon their own high organization as upon the origin of the Phytophaga, the group from which they have presumably been derived. This is a matter which Kolbe has not nearly so fully discussed. He agrees with

Lameere that the Prionidæ are the most primitive of the Phytophaga, and in the genus *Parandra* they recognize the form which they consider to be the most primitive of all. This genus has a considerable resemblance in general form and in the structure of the antennæ to the *Passandrini* and other Cucujidæ, which they look upon as the most primitive of the Clavicornia.

In Ganglbauer's opinion, *Parandra* is by no means the most primitive but rather a considerably modified form of the Prionidæ, and its resemblance to the *Passandrini* he attributes to convergence resulting from a similarity in habits of life, a view with which I quite concur.

Not less significant than the resemblance in the form and structure of the antennæ between *Parandra* and the *Passandrini* is, I think, the fact that the antennæ are frequently strongly serrate, pectinate, or flabellate, in many of the lower and less specialized genera of Longicorns, and only rarely so in those of the higher groups of the same family.

But while it is true, as Kolbe points out, that the brush-like sole and crypto-pentamerous condition of the tarsi characteristic of the Phytophaga is met with also in some of the Clavicornia, no great significance need be attached to that fact. It is only in the more modified forms of each group that the resemblance is very great. In many genera of Elateridæ and Cleridæ, and in some Dascilloidea, the fourth tarsal joint is as much reduced in size as it is generally in the Phytophaga.

In endeavouring to trace back the origin of the Longicorns, wing-venation does not greatly help us. Its least modified condition in this family is to be found in the Lepturini and Philini, and here its resemblance to that of the Clavicornia and Heteromera is tolerably close, and does not preclude the supposition that these groups and the Longicorns may have had the same or very closely related ancestors. On the other hand, it is just as close, perhaps even more so, to that of the Dascilloidea, a group which takes us back still nearer to the Malacoderms.

But whatever may be the correct view as to the origin of the Phytophaga, the question still remains, Did they or did they not originate at an earlier date than the Lamellicornia? Ganglbauer believes they did; but against his view, which certainly has some strong points in its favour, we have to consider the simple pentamerous condition of the tarsi in the Lamellicornia, the separation of the sternites and pleuræ of the second and third abdominal segments, the lesser number of the Malpighian vessels, and also what appears to be the less specialized structure of the larvæ in this group. The last point is of little importance; larvæ are subject to many secondary modifications, and the Lamellicorn larvæ are in some respects perhaps even more modified than those of the Longicorns. But the other points are significant, and seem to favour the view that the

Lamellicornia are an older group than the Phytophaga. It is possible, however, to hold this view without going so far as Kolbe, who finds a relationship between the Lamellicornia and the Staphylinidea, and classes them together in the same first division of the Polyphaga. He agrees with Ganglbauer that the wing-venation of the Staphylinidea has been derived directly from the Adephagan type. He must, I think, be prepared to maintain that the wing-venation of the Synteliidæ and Lamellicornia has also been derived directly from that type, for otherwise there would be a difficulty in accepting his classification.

(To be continued.)

LEPIDOPTERA IN WEST SUFFOLK.

BY LT.-COLONEL C. G. NURSE, F.E.S.

IT is more than thirty-five years since I first, as a schoolboy, began to collect Lepidoptera in this county, and it is only within the last few years that, on the conclusion of my Indian service, I have been able to return as a resident to my old collecting ground. During the past five years, except for an interval of about fifteen months spent in India, I have devoted the greater part of my time to collecting insects in this neighbourhood. I have paid attention more particularly to Lepidoptera and Hymenoptera, but have also made collections of Diptera and a few Neuroptera. In the present paper I propose to give some account of the less common Lepidoptera I have met with, together with a few remarks on the absence of some generally common and conspicuous insects.

This locality does not appear to be a good one for butterflies, and although I am out almost every fine day, and my collecting ground extends more or less for a radius of ten miles from my house, I have come across only twenty-seven species, including a specimen of *Colias edusa*, seen but not captured. I think this is a very meagre total for about four seasons' collecting. The absence of several more or less common species may be mentioned. I have not seen a specimen of *Pararge egeria*, *Vanessa polychloros*, *Pyrameis cardui*, nor a single "fritillary," although *Argynnis euphrosyne* used to occur in a wood where I have recently sought for it in vain.

Some of the larger moths also seem to be much less common than they used to be. I have not recently come across *Sphinx ligustri*, either in the larval or imago stage, though I used to meet with it frequently thirty years ago. I have already, on page 94 of the 'Entomologist' for the current year, given an account of my experiences with the Sesiidæ; I may add, however, that although in some localities here *Sesia respiformis* and *S. culiciformis* are common enough in the larval stage, I have

only once observed the former in the imago stage, and the only imagines I have seen of the latter were those I bred. One may thus easily understand how the species of this genus are generally considered rare until their life-history is known, and special search made for the larva or pupa. I have taken several larvæ and pupæ of *Cerura furcula* and *C. bifida*, but have not met with *Dicranura vinula* in any stage. I beat a single larva of *Stauropus fagi* at West Stow, in the same locality where Mr. Wratishaw obtained it forty years ago, but the insect must be very rare in West Suffolk.

Several Notodontidæ occur, the best being perhaps *Pheosia dictæoides*. Every year I obtain a few pupæ of *Palimpsestis octogesima*; on one occasion I found five pupæ at a single Lombardy poplar, but usually I get only three or four each season. The absence of *Cosmotriche potatoria* is somewhat remarkable; I have not once come across the conspicuous larva of this usually common insect. I obtained, by beating, a few larvæ of *Hylophila prasinana* and *H. bicolorana*, and duly bred specimens.

Many of the trees in this neighbourhood show signs of the ravages of *Cossus ligniperda*, but the imago is difficult enough to obtain, and the only specimen I have added to my collection came to light in the house of a relative. I have noticed that trees that have been struck by lightning are frequently attacked, and almost invariably on the side of the damage. I have only once come across the imago of *Zeuzera pyrina*, but on several occasions, when investigating a branch that showed the working of a larva probably belonging to this species, I have found that a woodpecker had been before me.

Of the less common Noctuidæ, in addition to such local species as *Emmelia trabealis*, I obtained the following:—*Craniophora ligustri*, bred and taken at sugar; *Leucania straminea*, common in the larval stage at Ampton; *Nonagria dissoluta* and var. *arundineta*, both forms bred; *Noctua ditrapezium*,* four at sugar and one at light; *Xanthia citrigo*, common in the larval stage; *X. aurago*, one bred from a larva beaten at Ampton. I found larvæ and pupæ of *Hydræcia micacea* common in dock roots, but professional collectors, in the shape of moles, had in many cases been before me, and I found it useless to investigate any root, even if honeycombed with the work of the larva, when the ground near it showed signs of the recent work of a mole.

I obtained a number of Geometridæ, including of course the local *Acidalia rubiginata*, *Anticlea berberata*, and *A. sinuata*, &c. Perhaps the best insect of this family was a single specimen of *Eupithecia irriguata*, at rest on an oak-trunk. Other Eupitheciids were *E. laricæata*, *E. tenuiata*, and *E. dodoneata*. Of the last species I got several pupæ under hawthorn bark, and following up the clue, beat larvæ from the same trees later on. From remarks in Barrett's book I rather expected to find the larva on

Quercus ilex, but, although there was a tree of this kind in the midst of hawthorns on which the larvæ of *dodoneata* occurred, I quite failed to get any larvæ on the *ilex* except a few of *Hybernica marginaria*.

Pyrausta ostrinalis occurs commonly between Elveden and Barnham. One specimen of *Pionea margaritalis* was trodden up at Tuddenham, but I searched in vain for larvæ later on. A few larvæ of *Oxyptilus distans* were swept from a species of *Crepis*, and I found occasional specimens in the imago stage in widely separated localities. Larvæ of *Acipitilia galactodactyla* were common on burdock, and I got a single *A. tetradactyla* on Newmarket Heath.

Chilo phragmitellus seems to occur in all the reed-beds here, and a nice series was bred. Two specimens of *Schænobius forficellus* were trodden up in the daytime on the edge of a pond at Barnham, and I caught a single *S. gigantellus* at Ampton. *Nephopteryx spissicella* was not uncommon at Ampton and West Stow, and I bred a very dark form of *Rhodophæa adrenella*. *Homœosoma sinuella* was fairly common, and the thistle feeders, *H. nebulella* and *H. binævella*, were also obtained.

In 1910 I paid a good deal of attention to Tortrices, and among those obtained were:—*Leptogramma literana*, one at West Stow; *Peronea aspersana*,* two at Newmarket; *Sciaphila hybridana*, at Timworth; *Antithesia salicella*, Ampton and West Stow; *Retinia pinicolana*, in numbers at Ampton; *R. turionana*,* one caught at Ampton, and two bred; *Pædisca semifuscana*,* and *P. rubiginosana*,* one of each at Tuddenham; *Carpocapsa nimbana*,* single specimens at West Stow and Livermere; *Asthena pygmaæana*,* common at Troston, and also occurs less commonly among spruce fir at other places in the neighbourhood; *Stigmota perlepidana*,* common at Ampton and Timworth; *Aphelia osseana*,* common at Newmarket.

Of the Psychidæ, I found cases of *Fumea intermediella* not uncommon at Ampton and West Stow, but all the imagines that resulted, except one, were females. From a case of *Talæporia pseudobombycella* found on a beech-trunk at Ampton I duly bred the moth.

The only Tineid new to Suffolk that I obtained was *Stenolochia gemmella*,* from Culford. Other species were *Adela rufimitrella*, Ampton and Timworth; *Cerostoma sequella* and *Depressaria hypericella*, bred; *Lemnatophila phryganella*, two at Ampton; and a nice series of *Orthotelia sparganiella* bred from larvæ and pupæ found in a pond at Barnham.

All the insects obtained at Newmarket were caught within the Suffolk boundary. I have to thank the editor, Mr. Richard South, for kindly determining for me many of the smaller and less easily identified species. Those marked * are new to Suffolk.

Timworth Hall, Bury St. Edmunds: April 9th, 1911.

CONVERSAZIONE OF THE ENTOMOLOGICAL SOCIETY
OF LONDON.

THE Entomological Society is to be congratulated on having secured the Linnean Society's rooms in Burlington House for the second *Conversazione*, which took place on the evening of Wednesday, May 17th. The Library is admirably suited for the display of exhibits; and the Lecture Room for the Addresses, delivered on this occasion by Professor E. B. Poulton, F.R.S., on "Recent Discoveries in Insect Mimicry," and by Mr. F. Enock, F.E.S., on "The Tiger Beetle (*Cicindela campestris*)," both of them receiving a hearty welcome from large audiences, to whom the many and excellent lantern slides were an additional delight.

Upstairs the exhibitions were arranged in such a way as to be seen to the best advantage; perhaps the most attractive being the Hon. N. C. Rothschild's and Dr. Karl Jordan's model of the Tropical Plague Flea (*Xenopsylla cheopis*), showing that insect about the size of a well-fed cat! The same two Fellows also brought from Tring exceptionally instructive cases of Gynandromorphs and Papilionidæ from New Guinea. Mimicry so much under discussion at the present moment, was objectively presented in the exhibits contributed by Lord Avebury, F.R.S.; Professor E. B. Poulton, F.R.S.; Mr. C. A. Wiggins; Dr. W. A. Lamborn; and Mr. E. G. Joseph, respectively; Mr. H. Eltringham's beautiful drawings for the plates of his 'African Mimetic Butterflies' supplying a further insight into the mysteries of the several groups screened by him; while presented with the exquisite finish and delicacy we associate with all his work were Mr. Enock's series of photomicrographs of new species of British Mymaridæ. Other extremely popular exhibits were Mr. W. C. Crawley's and Mr. H. St. J. K. Donisthorpe's observation nests of British ants with guests, the latter showing also cases illustrative of ants and myrmecophilous insects, and myrmecophilous Acari and Coccidæ under the microscope; and Miss Fountaine's magnificent collection of bred *Charaxes*. In the "living" department may be noticed Mr. G. R. Baldock's "Stick Insects," born and bred in this country from an Indian parent, and the many examples of larvæ and pupæ of British Lepidoptera brought by Mr. L. W. Newman. But to our disappointment, especially at a time when so much is being heard on the subject of economic entomology, exhibits of the applied science were conspicuous only by their absence—Mr. F. W. L. Sladen's Living Workers of his British Golden Bee being the only item of the kind in an otherwise quite sufficiently well-filled list.

From the short space at our disposal we have been compelled, of course, to omit a number of hardly less interesting exhibitions than those mentioned. We must record, however, our pleasure and thanks to the Linnean Society for the fine case

of "Relics of Linnæus"—books, medals, MSS., field equipment and the like—and to Professor Selwyn Image, whose "Old Entomological Books" gave us an opportunity of comparing the artistic genius of the "Aurelian" fathers, by no means to their disadvantage, with the latest products of pen, pencil, and process! Fellows and guests were received at the head of the staircase by the Rev. F. D. Morice, President, and the Rev. George Wheeler, Secretary, and Mrs. Wheeler; while to the Hon. Secretary of the Committee, to Mr. Stanley Edwards, Mr. R. Adkin, and those other Fellows immediately responsible for the success of the *Conversazione* we offer our sincerest congratulations. At the same time we venture to hope that more Fellows will support the next gathering, especially from among the younger ranks of the Society.

H. R.-B.

BY THE WAY.

THE thanks of all naturalists are due to Mr. A. E. Shipley, F.R.S., for his efforts to defeat the appropriation of a part of the grounds of the Natural History Museum, in Cromwell Road, by the Science Museum. A Memorial has recently been presented to the Cabinet by Mr. Runciman, proposing the erection of a new Spirit-Building upon ground, to be alienated for that purpose, belonging to the Natural History Department, to the north of the Museum. The present Spirit-Building, with its fittings, has cost over £30,000; but Sir Henry Roscoe, one of the principal signatories of the alienation Memorial, appears to think it inadequate, and would consider as "a national disaster" any action which prevents the erection of a new one "on the proposed site." Mr. Shipley's counter Memorial most correctly emphasizes the fact that to restrict the expansion of the already overcrowded Natural History Museum would be no less disastrous. How immediate is the need for this expansion is best illustrated by the galleries and high wall-shelves already placed in the Insect "Room," the contents of which are among the smallest objects preserved. What then must be the condition of the Palæontological Section, where the objects reach the opposite extreme of size, when, as Mr. Shipley truly points out, "more gigantic species . . . are being discovered by expeditions at present in the field"? We must unite to repel all such encroachments.

Every provincial entomologist, it may be presumed, has some interest in the museum of his particular town or county. Yet this interest is by no means forcibly exemplified when visiting any such establishments. A year or two ago we looked over most of the Yorkshire museums—Leeds, Dewsbury, Bradford, Huddersfield, York, &c.—and the result was distinctly disappointing, except in the case of the first-named, where the economics were well though scantily exhibited; the others all

contained some insects, though—whether Britishers caught in the building or exotics acquired from the Himalayas and Brazil—unnamed. We have not heard that our note to the ‘Yorkshire Post’ has effected amelioration. In the Eastern Counties things are but little better and, with the exception of the fine exhibits at Cambridge, nothing but Lepidoptera and Coleoptera are to be found. The Rev. J. H. Hocking and Mr. Skepper presented the former, respectively, to Ipswich and Bury St. Edmunds; the collection of the latter at Ipswich was purchased some years ago, and we had the pleasure of presenting the Bury lot. Norwich possesses a comprehensive show of beetles (the collection of old Robert Scales, the friend of William Kirby, we believe) and the magnificent parasitic and aculeate Hymenoptera amassed by John Bridgman during the “eighties.” Colchester and Lowestoft lag, and Yarmouth’s quaint museum boasts few insects.

Students of local distribution would do well to investigate the often neglected contents of all our local museums (those of the Isle of Wight Museum at Newport were in a deplorable condition when we last saw them). The task should not be onerous; specialists are more numerous now than twenty years ago. Local entomologists, though rarely the Curators themselves, would be competent to report adequately upon the extent and condition of their own orders. These should be tabulated against the name of each museum, and a Regular Register kept by a Standing Committee of recorders, to whom local authorities would find it to their own advantage to notify the more important accessions. Thus geographical distributionists would find a wide and hitherto almost unexplored field for investigation, which would add considerably to the perfection of local catalogues. Scientifically it is conceded by all (but the institutions themselves) to be useless for provincial museums to store up any but local exhibits—types should go to the National Collection—and it is quite certainly in working out the productions of their own county, or peculiar geological formation, that these museums in the future will most materially assist the general scientist.

C. M.

NOTES AND OBSERVATIONS.

HYBERNATION (?) OF *PYRAMEIS ATALANTA*.—The references in this month’s ‘Entomologist’ to the hybernation of *Pyrameis atalanta* remind me that I received, on January 14th last, a lively example, which had been rescued from a dog belonging to Mr. Morris, of Leigh-on-Sea. Where the dog found the butterfly is not known, but, considering the rough treatment the latter must have received, its condition was surprisingly good.—F. G. WHITTLE; 7, Marine Avenue, Southend, May 7th, 1911.

SCARCITY OF PYRAMEIS ATALANTA IN 1910.—I can fully confirm Mr. L. W. Newman's remark (*antea*, p. 100) on the scarcity of *P. atalanta* last season. I can only recall to mind seeing one specimen on the wing (early in October), and 1910 is the first year out of twenty that I have missed finding *atalanta* larvæ, although I frequently searched for them.—F. W. FROHAWK.

LOPHOPTERYX CARMELITA IN NORTH LANCASHIRE.—I reared a fine female of *N. carmelita* on May 2nd, 1911, from larvæ taken in July, 1910, off birch on mosses not very far from Lake Windermere.—THOMAS BAYNES ; 70, Sunderland Terrace, Ulverston, Lancashire.

SURREY ORTHOPTERA.—Mr. E. J. Burgess-Sopp sends me a short addition to my list (*antea*, p. 51) :—*Labia minor*, Farnham district ; not uncommon. *Chorthippus elegans*, Tilford and Hale. *Gomphoceris maculatus*, Frensham and Farnham Commons ; common. *Leptophyes punctatissima*, Farnham district, Tilford, Frensham. *Pholidoptera griseo-aptera* (= *cinereus*), Hale. *Tetrix bipunctatus*, Farnham district generally. *Metrioptera brachyptera*, Frensham Heath (one).—W. J. LUCAS.

MAMESTRA PERSICARÆ IN SCOTLAND.—In 'Moths of the British Isles' (vol. i. p. 240), I see it stated that *M. persicariæ* is only doubtfully recorded from Scotland. It may, therefore, be of interest to state that I took a specimen in fine condition off ragwort on the Morayshire coast, some twenty miles from here, the end of last August, and also saw another, which, having emerged earlier, was in too poor condition to take.—(Capt.) H. HOLMES-TARN ; The Lodge, Craigellachie, N.B., May 12th, 1911.

NOTE ON LARVÆ OF MERODON EQUESTRIS.—It may be of some interest to your readers to record the occurrence in England of the larvæ of the "narcissus fly," *Merodon equestris*, in bulbs of *Habroanthus pratensis* and *Vallota purpurea*, during the past winter. The fly has been hatched out from the former in this Laboratory, and is now in the British Museum. Hitherto the grub has been looked upon only as a pest of *Narcissus*, but this makes it evident that it can attack and destroy other bulbs as well. The Rev. W. Wilks, of Shirley, Croydon, tells me he has found the grubs in lily-bulbs.—FRED. J. CHITTENDEN, Director ; The Laboratory, Royal Hort. Soc. Gardens, Wisley, Ripley, Surrey.

LEPIDOPTERA AT LIGHT IN ISLE OF WIGHT.—On May 18th I obtained at street-lamps here *Lophopteryx camelina*, *Notodonta trepida*, *Drymonia chaonia*, *D. trimacula* (*dodonea*), and *Pheosia tremula* (*dictæa*).—G. NOBBS ; E. Cowes, Isle of Wight, May 24th, 1911.

PLUSIA MONETA AT READING.—My first capture of the above at Reading was July 13th, 1901 ('Entomologist,' vol. xxxiv. p. 255). Also see 'Entomologist,' vol. xxxvii. p. 214 and vol. xxxviii. p. 281. Since those dates I have taken the species as follows :—1906, June 14th, larvæ full-grown ; June 28th, imagines. 1908, May 28th, mature larvæ ; June 28th, imagines. 1909, May 31st, full-grown

larvæ. 1910, May 29th, full-grown larvæ. 1911, May 2nd, very small larvæ. All the above were obtained in my own garden. My son has taken larvæ in a garden about a mile from here, this year.—W. E. BUTLER; Hayling House, Oxford Road, Reading, May 14th, 1911.

PLUSIA MONETA.—In reply to C. Nicholson's enquiry respecting this species in "Notes" of last month, I am glad to report my acquaintance with this species. In 1906, I was living in a village near Luton and a friend with whom I worked informed me of having found some larvæ. I searched some monkshood and delphinium in some friends' gardens and discovered larvæ, which I reared. In 1907 and 1908 I obtained several larvæ. In the latter year I left for Letchworth, Herts, bringing some plants of monkshood with me. I am glad to say, that in 1910 and the present year, the larvæ have been found in my garden on the above plants, which appear to be the only pabulum selected in this district. I may add I have not seen any monkshood in any other garden but my own here.—Rev. E. EVERETT; "Ashleigh," Broughton Hill, Letchworth, May 23rd, 1911.

PLUSIA MONETA IN WALES.—I took my first specimen of *P. moneta* in the garden here, at the end of June, 1906. In 1908 I visited some monkshood (*Aconitum napellus*) growing on the banks of the Ely River, some six miles from Llandaff, and found the moth had well established itself, as I took twenty-six specimens in two nights. In 1909 I took sixteen specimens in one night. Last week I visited the spot to see if I could find the caterpillar, and took twenty-two in little over an hour's time by beating the food-plant. The ground on which I found the larvæ has been flooded several times this winter with two or three feet of water, so that their being under water for a considerable time does not kill them. I have little doubt that the moth has spread through Wales wherever its food-plant is found in plenty.—E. U. DAVID; Yscallog, Llandaff, May 17th, 1911.

LARVA OF VANESSA ANTIOPA.—Respecting the Rev. Claxton's note (*antea*, p. 184), I have looked up the record in the 'Ent. Mo. Mag.,' vol. vii. p. 109 (which is obviously the one he remembers reading), and should like to point out the fact that it refers to a larva of *V. antiopa* which Mr. Stainton found on August 10th, 1870, at Andermatt, *not Scotland*; it therefore does not "supply the needed authentic instance," as Mr. Claxton suggests. I still maintain there is no proof of the larva having ever been found in a wild state in Britain, which may be owing to this species probably not migrating to this country in the spring, only doing so after its emergence in the summer abroad, and like its near relative *V. polychloros* and other Vanessidæ which have but a single emergence yearly, not pairing until after hybernation, when the specimens are too scarce and widely scattered over this country to find each other for pairing in the spring. I may here take the opportunity of correcting a slight error which occurred in my previous note, *viz.* 1892 should read 1902.—F. W. FROHAWK; May, 1911.

CHRYSOPHANUS DISPAR—A MEMORY.—Information relative to the former haunts of our lost "Large Copper" is interesting, but per-

haps readers of the 'Entomologist' may not be aware that in the "twenties" and "thirties" of the nineteenth century *Papilio machaon* was regarded as almost as great a rarity. In this connection I venture to quote the 'Reminiscences of the late Albert Pell, sometime M.P. for South Leicestershire,' edited by Thomas Mackay (John Murray, 1908), as follows:—"When Whittlesea Mere was bright with water, one family of gipsies made a living by capturing for collectors the 'swallow tail,' a very rare and beautiful butterfly that fluttered among its reeds and sedges, also the large copper butterfly equally rare. So it was in my young days; but now all is gone—reeds, sedges, the glittering water, the butterflies, the gipsies, . . . and in its place, as the result of an enormous and unprofitable outlay, a dreary flat of black arable land. . . ." By a curious coincidence, it was at Pinner Hill, Middlesex, the house occupied by the Pell family of the previous generation, and then almost as remote in the country as the fens themselves, that I discovered in a case the three examples of *C. dispar* which I believe to have come from Benacre in Suffolk, as recorded by me elsewhere. Mr. Albert Pell was not only a great agriculturist, but also a close observer of bird life and a keen fisherman. — H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, May 20th, 1911.

VARIETAL NAMES.—In the report of the sale of part of the collection of the late Mr. J. W. Tutt (Entom. May 1911, 185), Mr. Adkin asks why so little interest was manifested in the many named varieties. To me the answer is obvious. With the exception of perhaps half a dozen British lepidopterists who are interested in the matter, no one uses such varietal names as *nigrorubida*, *ochrea*, *flavorufa*, *intermedia*, *minor*, &c., nor cares anything whatever about them. In the case of a strongly marked variation, where the whole *facies* of the insect is altered, such as in the var. *deschaugei* of *S. lubricipeda*; *varleyata*, *nigrosarsata*, and *lacticolor* of *A. grossulariata*; *doubledayaria* of *A. betularia*, and many others which at once occur to one's mind, a varietal name is not only advisable but necessary; but that a slight shade of colour, an extra spot, or the widening or contracting of a band, should entail the special naming of forms differing so slightly from the type is absurd. The craze for such name-making has caused a good deal of ridicule among lepidopterists generally.—GEO. T. PORRITT; Huddersfield, May 6th, 1911.

GLOUCESTERSHIRE LEPIDOPTERA.—Referring to my note on species new to the county in the 'Entomologist' (*antea*, p. 155), I can now add the following to my list:—*Pyrausta (Botys) fuscalis*, taken in the Forest of Dean among *Melampyrum* on June 23rd, 1910; *Schreckensteinia (Chrysocoris) festaliella*, taken in a wood on the outskirts of the Forest of Dean on April 13th, 14th, and 20th, 1911; *Phalonia (Argyrolepis) enicana*, taken on the Cotswolds on July 1st, 1909; *Coleophora murinipennella*, taken on the Cotswolds on May 17th, 1910; *Mompha (Laverna) ochraceella*, netted near Gloucester on July 16th, 1909, and also on the Cotswolds on July 21st, 1910; *Limnæcia (Laverna) phragmitella*, captured at dusk on the bank of the River Severn, near Gloucester, on July 23rd, 1905; *Elachista*

gleichenella, taken on the wing in the afternoon sunshine on the Cotswolds on July 8th, 1909, and July 7th, 1910; *Lithocolletis cerasi-colella*, taken in the Forest of Dean on May 18th, 1907; *L. pyri-vorella*, bred in May, 1905, from mined apple-leaf found in my garden.—C. GRANVILLE CLUTTERBUCK, F.E.S.; Heathside, Heathville Road, Gloucester, April 22nd, 1911.

BREEDING *TROCHILIUM APIFORMIS*.—I never attempted to breed this species but once, and then I was most successful by adopting the following plan: Having found, in the middle of February, 1875, twenty-two cocoons at the base of *Populus nigra* trunks, near Cambridge, I procured a large flower-pot, and half filled it with small broken pieces of another flower-pot. I then placed about three inches of loose mould on the top, and buried the cocoons perpendicularly in it, leaving them about a quarter of an inch above the surface. Of course, to be sure that I had placed them heads uppermost I had to make a small opening at one end of each cocoon, but this did not disturb the larvæ apparently, as the small opening was speedily closed again. I then covered them with a good thickness of loose moss, which was taken out, saturated with water, the superfluous moisture squeezed out, and the moss replaced; this was done about once a week. A piece of coarse muslin was tied over the pot-mouth, and the pot placed on two bricks (to allow a thorough draught) in an outhouse with the open window facing east to catch the morning sun. Between June 8th and 13th inclusive, from these twenty-two cocoons I bred twenty-two *apiforme*! nineteen perfect and three more or less crippled.—A. THURNALL; Wanstead.

QUERY RESPECTING *SESIA SPHEGIFORMIS*.—When walking the other day through a large wood in the Midlands, where "felling" was going on, I noticed that many of the birch-trees (from six to nine inches in diameter) were bored by, evidently, the larva of a Sesiid. As *S. sphegiformis* occurs in this wood, I concluded that the borings were made by the larvæ of this insect, but on closer examination I found that there was apparently no emergence hole through the side of the tree at the top end of the burrow, and that consequently emergence must have taken place through the entrance hole, as in the case of *T. bembeciformis* and *S. andrenæformis*. Unfortunately I could find none but old burrows, probably because of the age of the trees. Can any of your readers help me to elucidate the matter? *S. sphegiformis* is said to attack birch as well as alder. The late Miss Ormerod wrote: "The attack of the Alder Clearwing has long been known on the Continent as injurious to both birch and alder." But *S. sphegiformis*, so far as my experience goes, always emerges from the top end of its burrow, which for that purpose it diverts from the central portion of the stem up which it has fed. If therefore the burrows I saw were made by *S. sphegiformis*, its habit when feeding in birch differs from when feeding in alder, possibly because of the thickness of the birch bark, or possibly because of the amount of sap which the inner bark of birch always contains and which might drown the larvæ. If the work I saw was not done by *S. sphegiformis*, what other larvæ could be responsible for it?—PERCY C. REID; Feering Bury, Kelvedon, May 20th, 1911.

TROCHILIMUM CRABRONIFORMIS.—There is something almost uncanny in the way the larva of this species behaves towards the end of its larva hood, and just when it is preparing for its exit into the world as a moth. That it does leave a cap of thin bark over the exit-hole is a matter beyond dispute; I have seen hundreds of them. No doubt it requires a sharp eye, and even the finger-tips have sometimes detected these caps when the eye had failed to discern them. And behind this cap the burrow is horizontal for half an inch, more or less according to the thickness of the infested stump, then it ascends for about four inches, and at the top of this tube a light cocoon is spun, and the change to a pupa effected. Now, as this final bore is always left clean and free of frass for the passage of the pupa towards the open air, one is inclined to ask, "What has become of the excavated materials"? It is all dumped in the burrow below the level of the horizontal cut, and is used to prevent the pupa from falling down the old well, so to speak (on its way towards the exit), where of course, if it did go down, it would be sure to perish. But it is not actual excreta that is thus used for stopping—it might go bad, get mouldy, and give trouble. An examination of this material shows that it consists of splinters of wood, which could never have been passed through the creature's economy; it is evidently bitten off for the purpose for which it is used. I have opened many of these tunnelings, and hatched out the perfect insects; there were a few failures at first until I studied the conditions more closely, and then I began to see what was wrong. Often it will be observed on opening a cocoon that the enclosed pupa is covered with beads of condensed moisture; it looks, in fact, as if it were sweating profusely, which just means that the pupa is much colder than the surrounding atmosphere, although it, too, must be cool, not to say cold, when you consider it is in the heart of a sallow stump near the ground, shaded by the bush itself and the surrounding herbage. So keep the pupæ in a cold room or outhouse with no sunshine near them, and lying on the surface of some damp moss, but don't cover them with moss; provide means for reaching a position from which the wings can hang whilst developing, but over and above all that *don't* by any means cut out your pupæ until a day or two before the time when they hatch out under natural conditions in your district. Here, in Renfrewshire, the average date of hatching in a wild state is the last week of June and the first few days of July. I cut out these pupæ when I want them about June 23rd to the 25th, keep them cool, and now I rarely have a misfire. The pupa should be of a dark orange colour inclining to blackness almost when ripe for removing, and rather hard to the touch; if a pale straw colour and rather soft, it's a "moral" it will die, so it is best to leave all such in their natural state, closing up carefully the damaged burrow, and leaving it for at least a week or ten days, when it may be examined again. Mr. Carter and Lt.-Colonel Nurse might try these methods with *T. api-formis*; I have never had this species in pupa, as it does not occur in this district, but as the two species have evidently much in common, the treatment might prove successful.—A. M. STEWART; 38, Ferguslie, Paisley, N.B.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 13th, 1911.*—Mr. W. J. Kaye, F.E.S., President, in the chair.—Miss Alderoon, F.E.S., of Worksop, was elected a member.—Mr. Ashdown exhibited about one hundred species of conspicuous coleoptera taken by him in Switzerland during July, 1910.—Mr. Turner, living specimens of *Agapanthia asphodelas*, sent to him by Dr. Chapman from Hyères.—Mr. Adkin, an undetermined Agrotid from the Isle of Lewis, a *Sciaphila* from Unst, probably referable to *S. colquhounana*, and a *Pyrameis cardui* in which the row of spots on the hind wings were united into an irregular blotch.—Mr. Newman, on behalf of Mr. Oliver, a bred series of *Aphantopus hyperanthus* which had emerged in January and February. The larvæ had fed all the winter on *Poa annua*.—Mr. Hemming, series of *Brenthis selene* from Warwick and Sussex; the former were a much larger race in both sexes.

April 27th, 1911.—The President in the chair.—Mr. P. A. Buxton, of Tonbridge, was elected a member.—Mr. Tonge exhibited a pupa case of *Ægeria andrenæformis* as found *in situ*, projecting from the burrow after the emergence of the imago. He had found four such cases in nature.—Mr. Kaye, a similar exhibit with the living imago which had emerged in confinement, and a fine plant of the Mexican orchid, *Cattleya citrina*, in flower.—Mr. R. Adkin, a remarkable gynandrous specimen of *Bombyx quercus*, with left antenna and wings male and right antenna and wings female, but of the male colour. It was from the Capper collection.—Mr. Newman, a larva of *Callimorpha dominula*, black in colour without the yellow markings.—Mr. Andrews, two examples of the recently identified dipteron *Hilaria æronetha* from North Kent.—Mr. St. Aubyn, photographs of Lepidoptera at rest.—Mr. Gough, a dwarf example of *Celastrina argiolus*.—Messrs. Edwards and Turner, several species of *Papilio* from North America, from the *machaon* and *glaucus* groups.—Mr. A. E. Gibbs gave an account of the arrangements for the South Eastern Union of Scientific Societies Congress at St. Albans in June.—Mr. Dennis showed lantern slides of lichens and flowers.—Mr. Main showed a series of lantern slides illustrating his observations on the life-history of the common myriapod.—HY. J. TURNER, *Hon. Rep. Secretary*.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*April 4th, 1911.*—Mr. H. M. Edelsten exhibited series of *Noctua baia* and *Cidaria immanata* taken in Epping Forest in July, 1910, at rush blossom, on an occasion when sugar failed to attract Lepidoptera.

April 18th, 1911.—Mr. Huggins, two specimens of *Abraxas grossulariata*, with black nervures on hind wings. He also exhibited a somewhat dark example of *Ennomos alniaria* from Gravesend, and stated that the species seemed to be getting gradually darker in that district.—Mr. J. Riches, fifteen bred specimens of *Macrothylacia rubi*, all that emerged from a brood of about forty larvæ.—Mr. V. E. Shaw, a long series of *Triphaena comes* bred August, 1903, ex Findhorn ova, including vars. *clarkii*, *nigrescens*, *pallida*, *rufescens*, and *curtisii*, and also forms intermediate between *clarkii-nigrescens* and *pallida-rufescens*.

May 2nd, 1911.—Mr. G. R. Baldock exhibited a series of *Triphena pronuba* from Galley Hill, Essex, 1910, dark forms predominating, many specimens showing almost unicolorous blackish brown superiors.—Mr. P. H. Tautz, long series from Pinner, Studland Bay, and Hampstead; those from Pinner included many with grey costal streak, while the Dorset specimens included many very red examples and one with straw-coloured inferiors. Mr. J. E. Gardner exhibited a number of Lepidoptera from Exmoor, taken August, 1911, including *Xylophasia scolopacina*, common at ragwort: *Torocampa cracca*, *Asthena blomeri*, *Abraxas ulmata*, *Cidaria populata*, and a number of "micros," in which latter group of Lepidoptera the district appeared to the exhibitor to be particularly rich.—Mr. G. H. Heath, dark *Gnophos obscurata*, *Cleora glabraria*, and *Cidaria silaceata*, Exmoor.—Mr. L. W. Newman, a series of hybrid males ex *Nyssia zonaria* female and *Biston hirtaria* male; also hybrid females with narrow pointed wings, ex *Nyssia zonaria* male and *Biston hirtaria* female; he also showed *Smerinthus populi* var. *pallida*, and a female suffused with pink; also a fine gynandromorph, one side typical male and the other pink form of female; the body showed both colours evenly divided, and the legs corresponded in colour to that side of the body on which they were situated.—Mr. C. P. Pickett, *Angerona prunaria*, showing response to environment: pale larvæ fed under white muslin, darker reddish larvæ ex pink muslin sleeves, and still darker forms ex red sleeves.

May 16th, 1911.—Mr. B. S. Williams exhibited two examples of *Luperina gueneei*, the type form and one of var. *murrayi*, from St. Anne's-on-Sea.—Mr. A. W. Mera, imagines of *Endromis versicolor* that had gone through two winters in the pupal stage.—S. J. BELL, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting of the Society held at the Royal Institution, Colquh St., Liverpool, March 21st, 1911.—Dr. P. F. Tinne, Vice President, in the chair.—Mr. G. H. Watson, of Manchester, gave a lecture on "The Saturniidae, a Group of Wild Silk Moths." After reviewing the classification of the group, the lecturer detailed the work that is being done by himself and others in order to discover new sources of supply of silk and also to strengthen the races of silk-producing moths cultivated in Europe and Asia. The true silk moth is not known as a wild insect, although in China there are records of its cultivation upwards of 4000 years old. Occasionally disease ravages the inbred races of the insect, hence the necessity to introduce new blood. So far hybridisation has not been very successful, thus the efforts of practical entomologists are directed towards finding out and investigating new species of wild moths whose larvæ make a cocoon of serviceable silk.—Mr. Watson showed the Japanese silk moth, *Antheraea yama-mai*, and also the Tussor, or Indian, silk moth, *A. mylitta*, as instances of wild insects capable of culture and yielding a large quantity of valuable silk: *Saturnia pyretorum*, the moth whose larva yields the gut used for fishing lines, the production of which forms the staple industry in the Island of Hainan (China), also came in for attention. The lecture was illustrated by Mr. Watson's collection of twenty large drawers

containing many very rare species arranged with the silk they produce, the whole forming an educational exhibit of exceeding interest.

The concluding meeting of the session was held on April 9th, Mr. Geo. Arnold, Vice President, in the chair.—Mr. Wm. Mansbridge gave an address on *Grapholitha nevana* and *G.* (? var.) *geminana*, in which he dealt with the various forms of these insects in Lancashire and Yorkshire. He stated that in the West Riding the two species were in the imago state at the same time in localities near to one another, where the holly form (*nevana*) and the bilberry form (*geminana*) occurred. At Delamere however the bilberry feeder was worn at the time the holly feeder was beginning to emerge in the district around Liverpool. Although *nevana* from holly had a variation like *geminana*, it was never so pale as the latter, and the moth from bilberry was always smaller in size; *geminana* did not possess a black variation like *nevana*, but a very small percentage were unicolorous dark grey.—Mr. F. N. Pierce then described the results of his examination of the genitalia of the two species; after critically comparing a long series of preparations of both males and females he had failed to distinguish any point of difference. In discussion by the members it was held that the negative character of Mr. Pierce's results was not sufficient, in this instance, to sink *geminana* to the level of a variation of *nevana*.—Mr. Wm. Mansbridge exhibited a long series of *Selenia bilunaria*, comprising very dark speckled forms, and a new variation of a uniform dark ferruginous brown colour for which he proposed the varietal name *brunnearia*. Mr. C. E. Stott showed a specimen of *Panchlora nivea*, L., an exotic cockroach, taken on the wing at Trentham, North Stafford, in October, 1910.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

RECENT LITERATURE.

Fossil Insects and a Crustacean from Florissant, Colorado. By T. D. A. COCKERELL. (Author's edition, extracted from 'Bulletin' of the American Museum of Natural History. Vol. xxviii. art. xxv. pp. 275–288. New York: October 19th, 1910.)

INCLUDES descriptions of two new species of Trichoptera, four of Hymenoptera, and six of Diptera.

The Thorax of the Hymenoptera. By ROBERT EVANS SNODGRASS. No. 1774. From the 'Proceedings' of the United States National Museum. Vol. xxxix. Pp. 37–91, with plates 1–16. Published October 25th, 1910.

In this paper the external morphology of the thorax of the non-aculeate Hymenoptera is discussed and illustrated. As we understand the author, classification should not be based on thoracic structure alone, but on a study of the structure of all the parts of the body. Any system of taxonomy or phylogeny, he states, must be founded on a consideration of all the characters of all the forms concerned.

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THE ENTOMOLOGIST

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[No. 578

SOME ASIATIC BEES OF THE GENUS *ANTHOPHORA*.

By T. D. A. COCKERELL.

Anthophora caldwelli, Cockerell.

Foochow, China (H. R. Caldwell). U. S. National Museum. Formerly confused with *A. zonata*. The female has very bright greenish-blue bands, clypeus with a reversed yellow T, hind basitarsus with a good deal of white hair.

Anthophora calceifera, Cockerell.

Foochow, China (H. R. Caldwell). U. S. National Museum. Formerly confused with *A. zonata*. This species was described from Formosa. A male from Foochow differs from the type in having the lateral marks on clypeus somewhat smaller, and the abdominal bands all pale green. The fifth ventral segment of the male abdomen is emarginate in *A. caldwelli*, but has a straight edge in *A. calceifera*.

Anthophora zonata (Linnæus).

Foochow, China (H. R. Caldwell). One female. Trong, Lower Siam (Dr. W. L. Abbott). U. S. National Museum. The male from Trong agrees with *A. zonata* from Formosa; the four females differ much in size and in the tint of the abdominal bands, one large one has the bands a beautiful emerald-green. It seems improbable that there are two species here, but if there are, the males are needed for their satisfactory separation.

Anthophora zonata stantoni, new subspecies or variety.

♀. Length about 12 mm.; light face-markings formed as usual, but yellow; hair of thorax above orange-fulvous mixed with black; abdominal bands very brilliant, the first two greenish, the other two light blue; hind tibiæ with hair on outer side pale fulvous, on inner

black; hind basitarsi with much white hair on outer side; wings dusky; tegulæ dull ferruginous; eyes clear yellowish-green.

Hab. Manila, Philippine Islands (W. A. Stanton). U. S. National Museum. The male may show that this is a distinct species, perhaps nearer to *caldwelli* than to *zonata*. The abdominal bands are essentially as in true *zonata*, not at all as in *whiteheadi*. Lepeletier says of female *zonata* that the hind tibiæ have the hair on outer side longitudinally divided into black and white; some of the Siamese examples show this very well, but the Manila insect lacks this character, though it has a streak of black hair running down from the knee-plate. A closely related form is *A. zonata andrewsi* from Java and Borneo; it differs typically in the abdominal bands being yellowish-green, with coppery tints, but intermediate forms may occur. The hair on the hind tibiæ in *andrewsi* is as in *stantoni*.

Anthophora superans, Walker.

I have one of Walker's cotypes, labelled "Gebel Musa, Mt. Sinai." It is a male, and probably Walker's description was taken from this sex, although it is stated to represent a female. The species closely resembles *A. garrula*, but the first abdominal segment is entirely covered with fulvous hair, indicating an approach to *A. harmalæ*. The following characters are significant:—

Length about 18 mm., expanse about 28; pubescence fulvous; hair of head and thorax above without dark hairs intermixed; hair on inner side of hind basitarsi warm dark red; wings dusky hyaline; second s. m. exceedingly broad below, receiving first r. n. about middle; b. n. meeting t. m.; *face-markings pale yellow*, including front of scape broadly, the usual supraclypeal mark, lateral face-marks filling space between clypeus and eye, clypeus (without any black lateral marks, though lower margin is narrowly fusco-ferruginous as usual), labrum (with a small pellucid spot at each upper corner), and greater part of mandibles; labrum considerably broader than long; third antennal joint fully as long as the next two combined; flagellum very dark reddish beneath; middle tarsi long, but not otherwise peculiar; end of abdomen emarginate, hardly bidentate; abdominal hair-bands broad, entirely fulvous.

Anthophora quadrifasciata xerophila, new subspecies.

♀. Length almost 16 mm.; similar to *quadrifasciata*, except as follows: hair of head and thorax above pale ochreous; abdomen with four broad pure white bands; face-markings white; black lateral marks on clypeus smaller, not much broader than the interval between them; all the hair on first abdominal segment white. Very close indeed to *A. persicorum*, Cockerell, but a little larger, antennæ as far as third joint (rest missing) black, legs black, hind spurs black. The hair of hind basitarsus is entirely black, but the middle basitarsus has a large tuft of white occupying the basal half posteriorly. This runs exactly to *A. quadrifasciata* in Friese's tables.

Hab. Karachi, N.W. India, September, 1909; two females (E. Comber). British Museum. The wings are certainly no darker than in *quadrifasciata*; they are distinctly darker in *persicorum*.

Anthophora delicata, n. sp.

♂. Length about 10 mm.; flagellum about $4\frac{1}{3}$ mm.; black, including legs and antennæ; pubescence pure white, except on head and thorax above (including tubercles), where it is warm pale ochreous, of a very delicate and beautiful tint, on the middle of mesothorax and anterior part of scutellum with fuscous hairs intermixed; hair on inner side of middle and hind tibiæ and tarsi black, on inner side of anterior tarsi red; hind tibiæ with pure white hair on outer side; hind basitarsi with hair all black except a small white tuft at base; middle basitarsi covered with white hair on outer side; spurs black; antennæ long; third joint shorter than fifth, fourth broader than long; face-markings light canary-yellow, including clypeus (with only a little black on each side above), a small supraclypeal mark (but no lateral marks), labrum (with a pair of elongate small basal spots), and mandibles except apex; labrum a little broader than long; eyes red; face narrow, densely covered with white hair; wings hyaline, with a glaucous tint, nervures piceous; second s. m. narrow, receiving first r. n. much beyond middle; b. n. falling a considerable distance short of t. m.; abdomen with five broad white hair-bands, first segment hairy all over, but thinly on disc, so that it appears grey; apex broadly emarginate, subdentate.

♀. Similar, but larger and more robust, length about 12 mm.; face-markings similar, except that the black marks at sides of clypeus above are large, leaving a large triangular yellow interval between them, shining and irregularly punctured; flagellum dark red beneath except at base; third antennal joint as long as the next three together, fourth extremely short; hair of hind basitarsus black, with a basal white tuft on outer side; hair of middle tibia with a rufous apical patch; wings brownish. The abdomen of one specimen carries two pollen-bodies of an asclepiad.

Hab. Karachi, N.W. India, September, 1909 (E. Comber). British Museum. In Friese's tables the female runs to *A. velocissima* and the male to *A. nigricornis*.

The following key will separate the allied species:—

- | | |
|--|-----------------------------------|
| Spurs rufo-testaceous; male clypeus with anterior margin and a median stripe light (Quetta) | <i>pivicornis</i> , Fedtschenko. |
| Spurs black | 1. |
| 1. Hind femora of male incrassate; hind basitarsi of female white haired with black apical tuft (Quetta) | <i>velocissima</i> , Fedtschenko. |
| Hind femora of male not incrassate | 2. |
| 2. Nervures red-brown; face-markings ivory-white | <i>nigricornis</i> , Morawitz. |
| Nervures piceous; face-markings yellow | <i>delicata</i> , Ckll. |
| The male is the type. | |

Anthophora niveocincta, Smith.

This species was described by Smith from a specimen in the Baly collection, and consequently the type is not in the British Museum. Bingham quotes the original description, adding that he has not recognized the species. Smith merely cited "India" as the locality, but Dours describes both sexes from Pondichery, and places the insect as a variety (subspecies) of *A. albigena*. Mr. E. Comber has obtained both sexes in some numbers at Karachi, N.W. India; also a female at Hyderabad, and a male (October, 1909) at Lyallpur. Dours cites *A. calens*, Lepeletier, described from Africa, as the same species, but this is certainly not correct. Friese states that he does not know *calens*, but I have one from F. Smith's collection which seems to be correctly named, though the marginal hair-bands on the first three abdominal segments are fulvous, on the following two dull white. This, however, is a male, whereas Lepeletier describes a female, readily accounting for the difference. The insect is of course quite close to *niveocincta*, yet evidently distinct. *A. niveocincta* is the Indian (tropical) representative of *A. albigena*, or more especially of the closely related species or race, *A. savignyi*, Lepeletier. The female *niveocincta*, compared with *albigena*, differs thus: flagellum chestnut-red beneath; scape usually with a yellow mark; labrum longer in proportion to its breadth; face-markings strongly yellow, median band of clypeus broader; fifth abdominal segment with more white hair. Nurse reports true *albigena* from Quetta. *A. ruficornis*, Sichel in Dours, supposed to be a variety of *A. niveocincta*, is doubtless a distinct species, known by its entirely red antennæ in the female.

Anthophora camelorum, n. n.

Anthophora ruficornis, Fedtschenko, Turkest. Apid. i. p. 35, 1875. (Not Sichel in Dours, 1869.) Visits *Alhagi camelorum*, Fischer.

Anthophora albigena quadrata, new subspecies.

♂. Length about 9 mm.; differing from *A. niveocincta* as follows: face-markings creamy-white (as in *albigena*); labrum comparatively broad and short (as in *albigena*); flagellum black; hair of head and thorax above very pale ochreous, strongly mixed with black, producing a dull grey effect; abdominal hair-bands thinner. This is almost the same as *albigena*, but the clypeus has a pair of large quadrate black patches, emarginate below, their inner sides converging, but not closely approaching, above. The hind basitarsus is black-haired, with a tuft of white at base. End of abdomen bidentate.

Hab. Nasik, N.W. India (E. Comber). British Museum. *P. salviæ*, Morawitz, is similar but larger, with the scape all black, whereas in our insect it carries a large cuneiform white mark. The face-markings of *salviæ* are yellow, more in the manner of *niveocincta*.

Anthophora (niveocincta variety ?) amolita, n. sp.

♂. Exactly like *A. niveocincta*, except as follows: flagellum black, dark chestnut beneath; third antennal joint much longer and more slender, fourth about as long as broad; black marks on clypeus (which do not noticeably diverge below) long, leaving only a narrow apical band. The labrum is fully as long as broad.

Hab. Karachi, N.W. India (E. Comber). British Museum. The third antennal joint is about $432\ \mu$ long (272 in *niveocincta*). This is probably distinct, but only one specimen is known.

The following key separates the species collected by Mr. Comber in N.W. India, related to *A. quadrifasciata* and *albigena*:—

- | | |
|-------------------|----|
| Females | 1. |
| Males | 3. |
1. Large; hair on fifth abdominal segment white only at sides; sides of face densely covered with white hair, but no lateral face-marks . . . *quadrifasciata xerophila*, Ckll.
 Smaller; fifth abdominal segment with hair white, except a black median apical patch; flagellum ferruginous beneath 2.
 2. Larger; inner edges of black marks on clypeus widely diverging below; no lateral face-marks . . . *delicata*, Ckll.
 Smaller; inner edges of black marks on clypeus parallel or nearly; lateral face-marks present . . . *niveocincta*, Sm.
 3. Flagellum bright ferruginous beneath; face-marks yellow; scape with a yellow band or stripe in front . . . *niveocincta*, Sm.
 Flagellum dark, at most (*amolita*) dark chestnut beneath . . . 4.
 4. Scape all black; flagellum long; dark marks on clypeus much reduced *delicata*, Ckll.
 Scape with a light band or stripe 5.
 5. Labrum conspicuously broader than long; antennæ shorter; face-marks creamy-white; apical light band of clypeus very broad *albigena quadrata*, Ckll.
 Labrum about as broad as long; antennæ longer; face-marks yellow; apical light band of clypeus very narrow *amolita*, Ckll.

University of Colorado, Boulder: May, 1911.

NOTES ON THE DRAGONFLY SEASON OF 1910.

BY F. W. & H. CAMPION.

THE poor summer of last year afforded us very few opportunities for collecting Odonata. However, a few of the captures and observations which were made appear to be worth recording, as do also some of the experiences of our friend Mr. H. J. Watts, to whom we are indebted for the Gloucestershire specimens which we shall mention, as well as for some other records.

Sympetrum striolatum was taken at the Black Pond, Surrey; Reculver, Kent; and Staines, Middlesex: *S. sanguineum*, both sexes, at Wisley, Surrey (Mr. Watts): and *S. scoticum* at the Black Pond. *Libellula depressa* occurred at Hartford, Hunts (J. Peck, June 14th), and at Burnham Beeches, Bucks (June 19th), and *L. quadrimaculata* at Burnham Beeches (June 19th), and Holme, Hunts (June 20th). A few more males of *L. fulva* were obtained near Huntingdon on June 23rd, 25th, and 28th. All of them agreed with each other and with the single male taken in 1909 in having the basal spot on the hind wing strongly developed. In most of the specimens apical brown spots were present on the fore wings alone, although one of them, probably older than the rest, had similar spots on the hind wings also. All were fully matured; but one, with fore wings considerably frayed, retained the immature fulvous coloration of the principal nervures. The specimens were all of good size, the smallest of them being 44 mm. in length, and 75.5 mm. in alar expanse, and the maximum measurements obtainable from the series being 48 mm. for length, and 81.5 mm. for expanse. All but one of these males exhibited the copulation-marks to which Dr. F. Ris has recently called attention, that is, the rubbing away of the blue powder from segment five, or segments five and six, through the female clinging with her spiny feet to that region of the male abdomen during copulation, which in this species is a protracted operation.

The most interesting event which came to our knowledge during the year was the occurrence of *Somatochlora metallica* in Surrey. It will be remembered that as recently as 1908 the species was found, for the first time in England, in a part of Sussex. On June 26th, 1910, Mr. Watts took a fine male in a Surrey locality, and subsequently handed it to us for examination. The abdomen was stouter than that of the two Sussex specimens kindly given to us by Mr. E. R. Speyer, and resembled more nearly in this respect Mr. J. J. F. X. King's Scottish specimens. A few individuals were seen by ourselves at the same place on one or two days in August, but another capture could not be effected. Notwithstanding the close general resemblance subsisting between *S. metallica* and *Cordulia ænea*, we were quite satisfied that the scarcer insect was the one seen on the occasions in question. When flying in brilliant sunshine, *metallica* looked distinctly golden, and altogether unlike the other species. Moreover, whenever it appeared about the level of the water, some of the Agrioninæ teeming there were sure to dart towards it, a movement which obviously caused it annoyance. This curious conduct towards *metallica* on the part of smaller dragonflies was observed also by Mr. Speyer in Sussex, but we have never noticed anything of the kind in the case of *C. ænea* during our long acquaintance with that insect in Epping Forest.

A single male of *Gomphus vulgatissimus* was taken by Mr. Watts at Eynsham, near Oxford, on June 16th.

A female of *Brachytron hafniense* (= *B. pratense*) was procured at Ramsey (Hunts) on June 21st. [In July, 1897, an exceptionally late date for the species, a very fine female occurred to Mr. K. J. Morton at Monkswood, in the same county.] *Aschna mixta*, Mr. Watts informed us, was met with again at Pulborough, Sussex; a few males were taken by ourselves at Staines (October 2nd), and the species was also observed at the same place on October 16th. A male of *Æ. cyanea*, taken at Ealing on September 28th, was given to us by Mr. Charles C. Smith. On June 27th it was found that a male nymph of *Æ. grandis*, obtained at Burnham Beeches by Mr. H. F. Ashby (June 19th), and kept indoors, had already disclosed the imago. The species was seen in flight at the Black Pond on September 13th, and at Staines on October 2nd.

Calopteryx splendens, as usual, was flying in numbers over the River Ouse, near Huntingdon, during June. An interesting male taken on the 25th of that month had the right fore wing considerably reduced in size, and the venation of the apical area in a very aberrant condition.

Both of the British species of *Lestinae* were met with, *Lestes dryas*, in teneral condition, near Ramsey, on June 21st, and *L. sponsa* at Byfleet, Surrey, on July 24th and August 4th and 7th.

Specimens of *Platynemis pennipes* were obtained at Wolvercote, Gloucestershire, on June 17th. *Erythromma najas* was taken at Staines (May 22nd), Lechlade, Gloucestershire (June 15th), Wolvercote (June 17th), Holme (June 20th), and Byfleet (August 7th); and *Pyrrosoma nymphula* at Staines, Lechlade (including the female var. *fulvipes*), Burnham Beeches, Holme, Ramsey, and Byfleet.

Ischnura elegans occurred at Staines, Lechlade, Wolvercote, Holme, Ramsey, Hartford, and Byfleet. Immature specimens were plentiful at Hartford on June 25th and August 1st, and others were met with at Byfleet as late as August 7th. At Byfleet (August 4th) a male had larval water-mites on the under surface of segments four, five, six, and seven; in the case of segments six and seven the mites had lodged themselves in the ventral canal and caused a considerable distension of the abdomen. At the same place (August 7th) a male with an insect in its jaws was kept under observation for some little time; it was ultimately captured, and the prey found to be a small caddis-fly, which Mr. K. J. Morton was kind enough to determine for us as *Trienodes bicolor*. This observation was especially interesting, as being the first instance within our knowledge of an Odonate feeding upon one of the Trichoptera. On the same occasion evidence was obtained of *I. elegans* itself having fallen a victim

to another predaceous animal, for a mutilated female of that species was found lying upon a growing leaf; the contents of the thorax had been entirely abstracted, but the abdomen was left intact. Var. *rufescens* occurred sparingly at Staines on June 12th, but was quite common at Hartford on August 1st. Specimens were also met with at Byfleet on August 7th; in one of them the black of segment nine had strongly invaded the blue of segment eight, and formed a large spot of symmetrical outline occupying the apical third of the segment; a little black from segment seven had also encroached upon segment eight basally. The form of the female known as *infuscans* was also present at Byfleet on the same date.

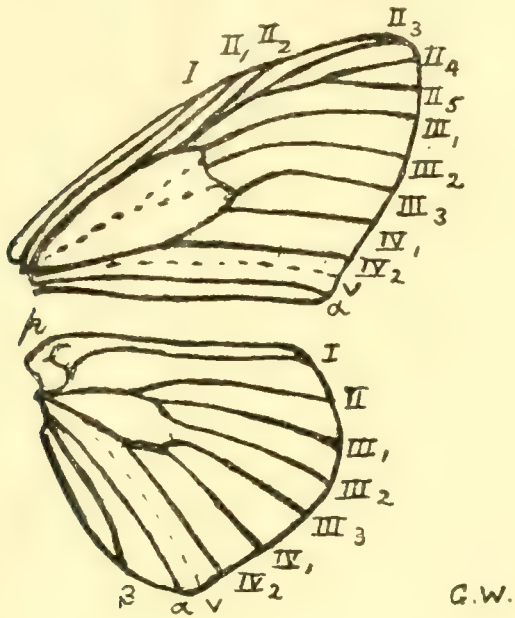
A large colony of *Agrion pulchellum*, reported to us by Mr. Watts in 1909, was met with at a stagnant pond at Staines on May 22nd. A living male was found there on June 12th entangled in a spider's web, from which, apparently, it was unable to escape. A remarkably small female was also taken; it measured only 32 mm. in length, and 40.5 mm. in expanse. At Holme (June 20th) a teneral female had a good-sized water-mite lodged on the inferior surface of the tibia of the right fore leg, an unusual situation for such a creature. As early as June 28th (Hartford) some specimens had their wings much frayed, and were obviously very old. Other localities which may be mentioned for the species are Wolvercote, Ramsey, and Byfleet. Localities recorded for *Agrion puella* were Staines, Lechlade, Burnham Beeches, Holme, Ramsey, Hartford, and Byfleet. A remarkable male from Gloucestershire, having the lateral branches of the U-shaped spot on segment two entirely separated from the transverse line, has been already mentioned in this magazine (vol. xliii. p. 331). Captures of *Enallagma cyathigerum* ranged from May 22nd (Staines) to September 13th (Black Pond); Lechlade, Wolvercote, and Holme were also among the places at which they were made. Teneral specimens were met with at Byfleet as late as August 4th, and the species was still emerging at the same place on August 7th. A male was obtained having the spot on segment two entirely disconnected from the posterior circlet (Byfleet, August 4th). On the same occasion a female, without an attendant male, was observed to be getting out of the water of the Basingstoke Canal with the aid of weeds floating on the surface. When taken, it proved to be a female of the straw-coloured form, and quickly resumed its normal appearance and activity. Blue females were obtained at Byfleet (August 7th) and the Black Pond (September 13th); the first-named specimens included one in which the antehumeral stripes and the prothoracic spots and border were distinctly brown.

58, Ranelagh Road, Ealing: May 13th, 1911.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 13.)



THE neuration of this group, and, indeed, of the whole genus, presents far more points of difference than could have been expected, and it has involved a prolonged study of the other two groups, as well as considerable excursions into the Argynnids and Brenthids. The accompanying diagram has been taken from var. *berisalensis*, and is drawn just twice the size of the original wing. I have, however, added, in dotted lines, the obsolete portions of nervure iii in the fore wing, and the nervure v in both wings, though these are quite invisible when the wing is flattened and mounted on card, as well as the indication of the cross nervule between iii₂ and iii₃ in the hind wing, though this is never present in *berisalensis*, because I shall have occasion to refer to them in treating of certain other species. I have used throughout the German nomenclature of Hoffmann, Spuler, and others, because all my notes had been made in this notation, and it can present no difficulty if accompanied by a diagram; and it has, moreover, the advantage of indicating the origin of the branch nervures, as may be seen from the neuration of the pupal wing.

With regard to the colour and texture of the nervures, it may be said generally that in the exclusively northern or mountain species they are much darker and coarser than in the others. This is peculiarly the case in those of another group—*cynthia*, *iduna*, and *merope*, but both the colour and texture of these is approached by *varia* and (making due allowance for its small

size) *asteria*; *aurelia* also, though by no means exclusively a mountain species, approaches this group very closely, another indication of its nearness to *varia*. Next to these comes *dictynnoides*, also a more or less mountain species; whilst mountain *athalia* are darker than those of the plain, northern *parthenie* than Italian, and *berisalensis* than typical *deione*. The finest and lightest species are *dictynna*, *parthenie* (Italian), and *britomartis*, but, whilst *britomartis* looks somewhat thicker than *dictynna*, the nervures of the former are apt to melt away to some extent with the action of the chemicals used for removing the scales, in a way which I have not noticed in any other species. It may be remarked here that while superficially the resemblance between *asteria* and *merope* is sometimes very close, yet the neururation (especially with regard to the point of departure of ii_2 in the fore wing) connects the former definitely with the *athalia*-, and the latter as definitely with the *aurinia*-group; in the same way, the form of the discoidal cell of the hind wing shows that we are right in placing *deione* with this group rather than with the group typified by *cinxia*.

To take the nervures, so far as they are distinctive, one by one:—Fore wing: *i* does not really offer any distinction, always reaching the costa without any upward curve; for, though I have found one specimen of *athalia* in which it anastomoses with ii_1 , and another in which it nearly does so, this seems to be due in both cases to the position of ii_1 .

ii_1 runs almost absolutely parallel with *i* in *parthenie*, *dictynnoides*, *deione* (type), generally in *berisalensis*, and occasionally in *varia*; it approaches *i* very gradually and almost continuously in *asteria*, and generally in *varia*; in *aurelia* it approaches *i* very slightly and gradually, and turns equally slightly and gradually away again; in *dictynna* it approaches rapidly and turns off gradually; in *britomartis* its position is between that of *aurelia* and that of *dictynna*; in *athalia* it approaches more closely, generally much more closely, to *i*, sometimes to the point of actual anastomosis.

The point of departure of ii_1 from the main stem of *ii* varies in different specimens of the same species, but is generally somewhat further from the base in *athalia* than in others; *dictynna* is perhaps the most variable, but the branch is generally rather high up, sometimes close to the top corner of the discoidal cell, though sometimes rather low down; in *britomartis* the position is also variable, but is generally rather low down, and never, so far as I have seen, very high up.

ii_2 – ii_5 offer no distinctive characters in this group.

Traces of the main stem of *iii*, with its first bifurcation about half-way up the cell, which are very distinct in *merope* ♀, are visible in this group in *asteria*, *parthenie*, and *dictynna*, and very slightly in *dictynnoides*. In *dictynna*, and possibly in *britomartis*,

it would seem to have divided very near the base; but of the latter (in which, as a rule, it can scarcely be traced) I have one specimen, in which not merely a fold but an actual nervure (representing the main stem and the upper part of the primary fork) is visible, where the branch could only have sprung from quite near the outer edge of the discoidal cell. The outer (as opposed to the basal) ends of the primary fork are just visible at the secondary branching in northern *parthenie*, and in *aurelia* and *berisalensis* (the upper one only in the last two), and more conspicuously, as a rule, in *dictynna*, as well as in some species of both the other groups.

The four central cross nervules are really the secondary bifurcations of *iii*, and join *iii*₁ to *iii*₂, and *iii*₂ to *iii*₃.

*iii*₁ and *iii*₂ are more nearly parallel—*i. e.* nearer to *Dryas paphia*—in *britomartis* than in any other species of this group, though perhaps not more so than in *aurinia*, in which, however, they are much more curved. *iii*₁ springs from near the corner of the discoidal cell, the short cross nervule coming outwards from the base at a sharp angle, in *parthenie*, *deione*, *berisalensis*, and *dictynnoides*, and generally in *athalia* and *dictynna*; in *britomartis* the cross nervule is more nearly, and sometimes quite, at right angles with *ii*; in *asteria* and *varia* *iii*₁ springs from the corner of the cell or close to it, and almost as close in *aurelia*; this point of departure is also by no means unusual in *athalia* and *dictynna*.

*iii*₂ is basally very close to *iii*₁ in *asteria* and *aurelia*, less so in *deione*, rather farther away in *parthenie*, and still more so in *athalia* and *berisalensis*, more nearly parallel in *varia*, *dictynna*, and *dictynnoides*, most widely separated in *britomartis*; but it is impossible to base any conclusion whatever on this characteristic, as there is considerable variety in the matter in the specimens of each species.

*iii*₃ is perceptibly less curved at its basal end (even without a lens) in *aurelia* than in any other species; the curve is slightly more abrupt in *asteria*, *varia*, and *dictynna*, and less so in *deione*, *berisalensis*, and *britomartis*.

(To be continued.)

SOME NOTES ON MELANISM.

By A. M. STEWART.

RECENTLY while passing along the edge of a small wood, in conversation with a gamekeeper friend, some remarks were passed on the occasional appearance of a black rabbit amongst those we saw around us. "Yes," my friend remarked, "whenever you see so many black ones you may depend upon it the stock is getting too much inbred. You see," he continued, "I

have only a small bit of a place, and the way we are hemmed in here we can hardly prevent it, but I am getting some fresh stock down from the hills, and we will soon get rid of the black lot."

Here, to me, was a new theory for melanism—may it not apply to insects as well as to the larger animals? At least it is worth a little investigation and reflection.

As for example, take the case of the environs of Paisley. To the north of the town there were at one time—within the memory of those still living—large tracts of virgin woodland interspersed with pine and birch woods. Gradually the woods were cut down, the heather burned, the land drained, and now all, or nearly all, this extensive area is under crops. But, as remarked, not all—a very few small woods and moorland patches still remain. And here the insect and bird fauna peculiar to pine, heather and birch finds its last stronghold, huddled together no doubt they are—to the extinction of many species once recorded as frequent or common in the district. Small wonder, then, if inbreeding is rampant! In a small wood of scarcely ten acres, with two acres of heather attached—virtually a fox cover—surrounded by smiling cornfields, the heather and pine insects are veritably on an island.

And we *do* get quite a number of dark and black forms of a variety of species—*Thera variata*: eighty per cent. are dark, twenty per cent. are black, the type we rarely see. *Eupithecia castigata*, we get a perfectly black form; it was known at one time as the "Paisley pug." *Cidaria suffumata* var. *piceata* is very frequent, and the same may be said of one or two others confined in these restricted areas.

Take another illustration of the point. The August of 1909 I spent my holiday collecting in the north-east end of the Island of Arran. Now, there is no smoke or dirt there to support the theory of their influence, yet I found melanic forms of various species were common. In a long narrow rocky glen I came twice upon small patches of billberry, only a few clumps to each colony, and from each clump were disturbed several specimens of *C. populata*; they were all much darker than the typical form, and some of a unicolorous dark coffee colour. They never settled on the rocks. The formation here is a dark slate-coloured schist, with grey granite boulders in the burn, some of immense size, but *populata* always sought refuge by diving into the heather or bracken thirty or forty yards up or down stream. I did not meet with the species again until I struck the second patch of food-plant, and then the same performance was repeated. Inbreeding under these conditions was not only probable but hardly avoidable, when we remember that the females of *populata* scarcely fly at all, so badly are they equipped in the matter of wings.

How far these suggestions will stand after further investigations it is too early yet to say, but to those with the time and opportunity it opens up a new line of enquiry, which may lead to some tangible result. And after all is said and done as to the value of protective coloration in insects during the imago stage, it is really during the larval period that the greatest mortality occurs, and their enemies then are far more numerous. Ichneumonids and birds, possibly, do the most damage in this respect. I once opened the stomach of a cuckoo shot amongst bilberry, and it was filled with the caterpillars of sawflies and Geometers, including one larva of the wood tiger—so that the ultimate shade of an imago is possibly of secondary importance. In the glen here referred to, *C. russata*, *Larentia cæsiata* and *L. olivata* were very numerous, and their greatest enemies in the imago stage were the spiders. One species of formidable size was common, and as their webs were always stretched across fissures and crannies of the rocks, their toll of insect life must have been considerable, but it would hardly be a protection to any moth to be a shade darker or lighter than its fellows once it came in contact with one of these webs, which had usually the owner sitting in the centre waiting for his or her next meal! Insect-feeding birds were rare—though a few large dragon-flies (*C. annulatus*) were hawking up and down the stream, but so far as my observation went they did not molest these moths, even when sent flying amongst them by the dozen.

In conclusion, I think Mr. Leigh is right when he says:—"There is probably some other factor at work in the production of melanic forms." And again: "It is of course quite probable that the dark colour of many species of moth is protective, while in others it may be of physiological importance, and associated in some way with constitutional hardiness," or, may I suggest? climatically hardy but reproductively a disadvantage.

NOTE.—The inbreeding of *Spilosoma lubricipeda* led to the production of the black form var. *radiata*.

38, Ferguslie, Paisley.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

By C. J. GAHAN, M.A.

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(Continued from p. 219.)

In the Synteliidæ and Lamellicornia, the wing-venation is considerably modified, and by reduction of the veins it comes sometimes to look like that of the Staphylinoidea; but there is

generally no difficulty in recognizing the hook-like connection which the anterior branch (M_1) of the media makes with the media, forming as it were a recurrent branch of the latter. It is scarcely probable that this character, which is the one most distinctive of the Cantharoidean type, has not been derived directly from that type, but derived instead directly and independently from the Adephagan type.

The larvæ of the Lamellicornia (those of the Synteliidæ are unknown) differ wholly in form and structure from those of the Staphylinoidæ. The primitive segmentation of the abdomen which the Lamellicornia have in common with the Staphylinoidæ—the character which seems to weigh most with Kolbe—is not confined amongst the Polyphaga to those two groups; it is a character also of the Malacoderms as a whole, and is met with as well in some of the lower forms of Terebrantia, Dascilloidea, Sternoxia, and Heteromera. And in view of this fact, admitted by Kolbe himself, I do not understand why he has not included the Malacoderms in his division Haplogastra, unless, as I have said, he is prepared to maintain that the wing-venation has been differently derived in each of his two divisions of the Polyphaga.

In Lameere's classification the Staphylinoidæ immediately follow the Lamellicornia in the linear arrangement, but that results from an entirely different view from Kolbe's, and is only because the Lamellicornia come as the highest and terminal group in his first division of the Polyphaga, while the Staphylinoidæ constitute the whole of his second division.

Larval Form and Structure.—If further justification were needed for a division of the Coleoptera into the two suborders Adephaga and Polyphaga, it would be found in a study of the larvæ. The larvæ of the Adephaga differ from all other beetle larvæ in having one more segment to each leg,* which also usually terminates in two claws, whereas in the other larvæ it never has more than a single claw. They are not only distinct in structure from all other Coleopterous larvæ, but they appear also to be more primitive. In their general form, their active movements, and their possession of jointed anal appendages, they recall Campodea and other Thysanura. The structure of their mouth-parts differs less from that of the imagines than it does in other Coleopterous larvæ.

The larvæ of the Staphylinoidæ also are active, Campodiiform, and possessed of anal appendages resembling cerci, and,

* The only exception known at present occurs in the Paussidæ. The first undoubted larva of this family was recently described by Dr. Böving. It has only five segments in each leg, as compared with the six present in other Adephagan larvæ. But its other characters point to its affinities with the Adephaga.

notwithstanding the lesser number of segments in the legs, have a great general resemblance to those of the Adephaga.

This resemblance is considered by Ganglbauer and Kolbe to indicate a relationship between the two groups, and is one of their reasons for placing the Staphylinoidea first in the suborder Polyphaga. It has been explained already that they regard the wing-venation of the Staphylinoidea as being derived directly from the Adephagan type, and that Lameere holds a different view. He believes that the resemblance between the larvæ of the Staphylinoidea and Adephaga has been brought about as the result of a convergence of characters, and is not to be attributed to any common inheritance. Nor does the Campodea-form of the Staphylinid larvæ appeal to him as a sign of their more primitive origin over that of the Cantharidiformes.

In consonance with his views upon the origin of metamorphosis in insects, Lameere holds that in insects with a complete metamorphosis the cruciform type of larva is more primitive than the Campodiform type, and therefore he does not admit the truth of Brauer's law when applied to these insects, although that law—namely, the nearer the larva is to the imago and to the ancestral form the more primitive is the type—does, he thinks, hold good in the case of the Heterometabola.

His views in this respect have left a marked influence on his classification. They explain to a great extent why he is so strong in maintaining the Cupedidæ as the most primitive family in the Adephaga, and in placing the Terebrantia as the first and most primitive group in the suborder Polyphaga, although he has given other reasons also for adopting this course. There is, however, a mistake in one of his reasons for regarding the Cupedidæ as the most primitive of the Adephaga, namely, that the abdominal rings are *not* fused together as they are in the other Adephaga. It is precisely for this reason that the sternites and pleuræ of the second abdominal segment *are completely* fused with those of the third, that Ganglbauer considers the Cupedidæ to be one of the more modified families of Adephaga, and that Kolbe in his later classification removes them from that suborder, in which, excepting the Paussidæ, the second sternite is only partially fused with the third, being distinct from it at the sides of the abdomen.

As Ganglbauer points out, mistakes of this kind are apt to arise from the custom followed by systematists of referring to the first visible sternite of the abdomen as the first ventral segment, whereas it is actually in some cases the sternite of the second, in others of the third segment, or else represents the sternites of the two fused together. The sternite of the first segment has in most cases disappeared, leaving no trace behind.

The principal characters taken into consideration for the purposes of classification have now, I hope, been sufficiently discussed to enable the reader to understand how the main differences in the three classifications have arisen. The other differences, relating chiefly to the number of the families and groups to be recognized and the arrangement of the families in each group, are less essential, and can best be considered if we give the outlines of each classification first before pointing out and discussing those that seem to be the more important.

(To be continued.)

NON-HYBERNATION OF *PYRAMEIS ATALANTA*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

For many years past I have paid particular attention to the habits of *Pyrameis atalanta* in this country. My experience is based on careful observation and the life-history of this species under natural conditions.

I am of opinion that *P. atalanta* does not hibernate in the British Isles any more than *P. cardui* does, and that there is no authentic record of *atalanta* ever having been found hibernating anywhere in Britain, and surely if it did spend the winter months in such a state, so common a species would have been detected, when we know of several instances of the decidedly rare *Vanessa antiopa* having done so. I know of specimens of the latter which have from time to time been found during the winter months and early spring, and even of one seen on the wing in midwinter, but have never heard of *atalanta* after the first spell of cold weather in late autumn or early winter has set in, which I believe is fatal to the species. Therefore Mr. J. C. Warburg's views (*antea*, p. 183) on the subject are entirely contrary to my own, and I quite agree with Mr. L. W. Newman that *atalanta* does not hibernate in this country.

The occurrence of this species in Britain is due to immigration of specimens in the spring. Usually the eggs are not deposited until June, as the following notes will show, which may interest Mr. Warburg.

On June 10th, 1894, I captured a female which deposited about one hundred eggs on the 14th. On June 27th, 1903, I watched a wild female depositing on nettles at Wallasea, Essex, and two days later (June 29th) I saw another depositing at Hockley, Essex. At 6 p.m. on May 24th, 1909, I captured a female while at rest on the wall of a house (Rayleigh, Essex), sitting with expanded wings resting in the sun. A strong east wind was then blowing which had been continuous for several days. I have every reason to believe this was a freshly arrived immigrant. Not wanting the specimen I gave her a drink and set her free.

The complete transformations of the summer emergence of *atalanta* are of short duration, occupying in all about fifty days—the egg state nine days; larval state twenty-three days; pupal state seventeen days—total forty-nine days from the time the egg is laid to the emergence of the imago. These are the average periods, which are liable to vary somewhat according to temperature.

The butterflies of the summer brood pair and produce others, so that a succession of broods occur during the summer and autumn, which accounts for the larvæ in all stages occurring from about the middle or end of June until the middle of September, and fully grown larvæ during the early part of October.

May, 1911.

SOME NEW CULICIDÆ FROM WESTERN AUSTRALIA, SOUTH QUEENSLAND, AND TASMANIA.

By E. H. STRICKLAND (Dip. S.E.A.C.).

(Continued from p. 204.)

Stegomyia tasmaniensis, n. sp.

Head with silvery scales round the eyes, remainder dark.

Thorax clothed with dark scales all over. Scutellar scales also all dark. Pleuræ and pro-thoracic lobes with silvery scales. Abdomen dark scaled with silvery lateral spots.

Legs dark, unbanded; silvery knee-spots on all femora, and silvery apical spot on all tibiæ. The last two hind tarsi, with part of the third, are of a dull white colour.

♀. Head clothed with flat scales, which are of a black colour, except round the posterior borders of the eyes, where they are white; and a few black upright forked scales at the back of the head. The proboscis and palpi are entirely covered with dark scales. Eyes dark brown. Clypeus black rugose. Mesothorax covered with blackish narrow curved scales with a slight brownish reflection. There are a few stout long bristles, especially about the wing roots. Scutellum with black flat scales, with a violaceous reflection, and strong posterior bristles to the lobes. Prothoracic lobes and pleuræ with silvery spindle-shaped scales. Abdomen with black flat scales, with a violaceous reflection; and with silvery apical lateral spots on all segments except the first two. Ventral surface of abdomen clothed with mixed white and dark scales, which are all white on the apical segment.

Legs with a white apical spot on all the femora and tibiæ. Fore and mid tarsi all dark, unbanded. Hind legs pale scaled on the inside along the entire length, last two hind tarsi, and part of third tarsus all dull white. Wings with brown scales, with a violaceous reflection. First fork cell long, slightly narrower than the second posterior, and its base considerable nearer the base of the wing; its

stem about one-fifth its length. Supernumerary cross-vein slightly nearer base of wing than the mid cross-vein, posterior cross-vein about two and a half times its own length distant from the mid cross-vein.

Length 5 mm.

Habitat.—Tasmania.

Observations.—Described from four females, all rather damaged.

Genus *ANDERSONIA*, nov. gen.

Head clothed in the centre with narrow curved and upright forked scales, and at the sides with flat scales as in *Culex*. Female palpi of four segments as in *Culicada*.

Thorax clothed on the greater part with narrow-curved scales, but on either side just before the wing-roots is a patch of flat and broad spindle-shaped, scales. Scutellum with narrow-curved scales. Abdomen with flat scales. Wing venation and scales similar to *Culicada*.

Male unknown.

One species only is known at present and is found in Tasmania.

This genus appears to be closely related to *Culicada*, from which, however, it can at once be separated by the presence of flat lateral scales on the thorax.

Andersonia tasmaniensis, n. sp.

♀. Head black, clothed with light golden small narrow curved scales, numerous similarly coloured upright forked scales, and cream coloured lateral flat scales. There are very few bristles on the head. Eyes bronzy. Antennæ with basal segment and basal half of second segment testaceous, the remainder dark. Palpi with very small fourth segment, somewhat densely scaled. Proboscis all dark in colour.

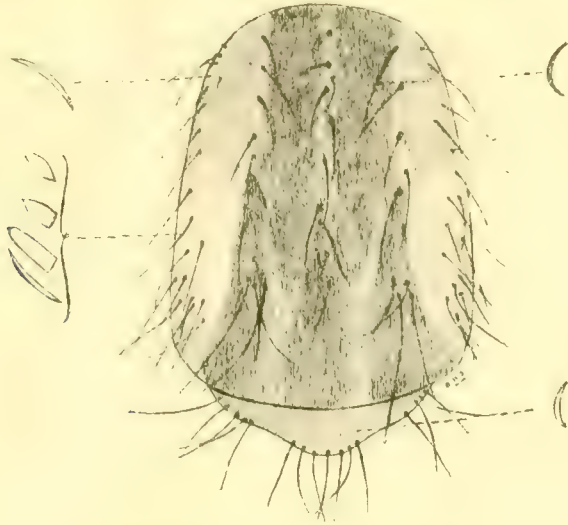
Thorax dark brown, clothed on the median area with small narrow curved scales, which are mainly of a dark brown colour; there is, however, a lighter median line of more golden brown scales on the apical three-quarters of the thorax; the basal quarter of the thorax is devoid of scales in the centre. There is, however, a narrow line of golden brown scales on either side of this area, bounded laterally by another small bare patch, which extends al-

most to the wing-root. The apical lateral third of the thorax is clothed with large golden yellow narrow curved scales, which lie with their apices toward the centre of the thorax. Just in front of, and extending to, the wing-roots is a very conspicuous patch of large

Female palp of *Andersonia tasmaniensis*, denuded of scales.



creamy white, spindle-shaped, flat and elongated narrow-curved scales; the last-mentioned, together with similar coloured hairs, are most numerous basally near the wing-roots. There are three distinct rows of black bristles on the thorax besides lateral bristles and those which surround the wing-roots. The central row terminates at the commencement of the bare patch before the scutellum. Scutellum with light yellow narrow curved scales. Prothoracic lobes with light yellow narrow curved scales, and a few bristles. Pleuræ with



Thorax of *Andersonia tasmaniensis*, n. sp.

creamy flat scales. Abdomen with flat scales. White basal lateral spots on all segments. This character does not appear to be quite constant, as in several specimens examined one or more spots were absent, while in two specimens there were traces of complete white basal bands on the second and third segments respectively. Ventral surface of abdomen white scaled. Wings densely clothed with brown *Culicada*-like scales. First fork cell narrower and considerably longer than the second posterior, its stem is not quite half its length. Supernumerary and mid cross-veins almost in a line, the former slightly nearer the wing base. Posterior cross-vein about its own length distant from the mid cross-vein.

Legs with femora, testaceous and clothed with mottled dark and light scales, replaced apically by a spot of ochreous scales. Tibiæ darker, but also mottled. Tarsi dark and all dark scaled.

Length 5.5–6.5 mm.

Habitat.—Tasmania.

Observations.—Described from eighteen females sent by Dr. Anderson. There were no males. The species is very distinctive, the sides of the thorax being distinctly lighter in colour than the median area, and in this it superficially resembles *Banksinella luteolateralis* (Theobald); the flat lateral scales, however, distinguish it at once from any other described genus.

South-Eastern Agricultural College, Wye.

November 22nd, 1910.

NOTES AND OBSERVATIONS.

HIPPOTION (CHÆROCAMPA) CELERIO AT BIRKENHEAD.—It may be of some interest to note that I saw, but did not unfortunately capture, a specimen of *C. celerio* in the garden yesterday evening at dusk. It was hovering over the flowers of lupin and other plants. I feel certain that I made no mistake, as the moth was within two feet of me, and I got a very good view of it.—RALPH RYLANDS; Highfields, Bidston Road, Birkenhead, June 12th, 1911.

CLYTUS ARCUATUS IN NORTH-EAST LONDON.—A specimen of this beetle was found on a wall in Wick Road, Hackney, on June 10th. It was shown by Mr. J. O. Braithwaite, at the meeting of the North London Natural History Society, at Finsbury, on June 13th.—V. GERRARD; "Kenmore," Connaught Avenue, Chingford, Essex, June 24th, 1911.

ÆGERIA ANDRENÆFORMIS IN VIBURNUM OPULUS.—On May 19th last I was agreeably surprised to find an old burrow of *Ægeria andrenæformis* in a branch of guelder rose (*Viburnum opulus*). On opening it I found it had produced an ichneumon! I have frequently searched *V. opulus* for signs of this species, but this is the only burrow I have detected. *V. lantana* is much more common than *V. opulus* in this district—Mid-Kent. Is *V. opulus* more often bored in localities where *V. lantana* does not so largely predominate?—P. P. MILMAN; Burham, near Rochester, June 16th, 1911.

LEPIDOPTERA AT LIGHT IN THE HASLEMERE DISTRICT. — On Monday night, June 5th, I took the following insects, on a white sheet placed in front of two acetylene lamps: *Stauropus fagi* (three males), *Palimpsestis fluctuosa*, and one example of *Drymonia trimacula* (*dodonea*). Some twenty other quite decent things were secured. Nearly everything turned up late as usual; the *S. fagi* did not appear until between 11.45 p.m. and 12.15 a.m. Mr. Norman Riley, of the South London Entomological Society, was with me at the time.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere, June 16th, 1911.

ERISTALIS ŒSTRACEUS, L., IN NORTH AMERICA (DIPTERA).—Several species of Syrphidae are known to be common to Europe and North America, but an addition to the list of such species has been made by Mr. Ernest E. Austen (Ent. Mo. Mag. xxii. 2nd series, p. 63). When determining a female specimen of *Eristalis*, from East Prussia, recently presented to the National Collection by the Hon. N. C. Rothschild, Mr. Austen found that it was referable to *E. œstraceus*, L. At the same time he discovered that the specimen described by Walker, some sixty years ago, as *E. œstriformis* was specifically identical with *E. œstraceus*, L.

CHRYSOPE FLAVA (NEUROPTERA).—In connection with Miss E. M. Alderson's paper (*antea*, p. 126) on this lacewing fly, the following records may be of interest for dates and localities. June 14th, 1896, one at the Black Pond, Esher Common, Surrey, by the side of its transparent filmy pupa-case; the wings were not fully expanded. July 1st, 1901, one received from Twickenham, Middlesex. June 7th,

1903, a large specimen taken while flying feebly in Surbiton, Surrey; probably it had not long emerged. June 21st, 1903, a specimen taken at Balham, London. June 21st, 1905, one taken at Horsley, Surrey. June 13th, 1907, one brought to me from Walton-on-Thames, Surrey. June 26th, 1909, one specimen, near Oxshott, Surrey. June 9th, 1910, an example taken from a fence in Fassett Road, Kingston-on-Thames, Surrey. June 12th, 1910, one taken at Claygate, Surrey. I have also two undated specimens from Macclesfield, Cheshire, given me by Mr. R. South.—W. J. LUCAS; Kingston-on-Thames.

A DIPTEROUS PARASITE BRED FROM IMAGO OF *NYSSIA LAPPONARIA*.—In April, 1909, amongst some females of *Nyssia lapponaria*, Bdv., from which I was hoping to obtain ova, I was surprised to find one, which had been able to walk about three days before, lying on its back and by its empty body the pupa of a dipterous parasite. From this the fly emerged twenty-two days later, and has been identified by Mr. C. J. Wainwright as a female of *Phryxe vulgaris* Fall. He has also been kind enough to tell me that, though it is an unusual event for an insect, parasitised in the larval stage, to develop fully, it is by no means unknown. But, if these flies have several broods, it seems to me possible that the egg was laid in the imago and that the whole oval and larval development of the fly took place in this stage. Females of *Nyssia lapponaria* almost always live more than a fortnight, and some of these parasites pass through their early stages much more quickly than this. Apart from the rarity of the occurrence, it has a further interest in that, so far as I know, it is the first recorded parasite bred from *Nyssia lapponaria* in this country.—E. A. COCKAYNE; 16, Cambridge Square, London.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 5th, 1911.*—The Rev. F. D. Morice, M.A., President, in the chair.—The following gentlemen were elected Fellows of the Society: Messrs. H. W. Davey, Inspector of the Department of Agriculture, Geelong, Victoria, Australia; H. Boileau, 90, rue de la Côte St. Thibault, Bois de Colombes, Seine, France; Rufus Mallinson, Oakland, Windermere.—The President announced the death of Mr. P. C. T. Snellen, of Rotterdam, the oldest Honorary Fellow of the Society, and moved that an expression of sympathy be forwarded to his family.—Mr. Robert Adkin exhibited, on behalf of Mr. Lachlan Gibb, of Montreal, Canada, three specimens (two males and one female) of a *Pieris* taken by Mr. Gibb at Lost River, Canada, in May, 1910, together with series of *P. oleracea* and *P. rapae* from the same and other Canadian localities for comparison. Mr. Gibb mentioned that *P. rapae* was not an indigenous species, but was said to have been introduced into Canada some sixty years ago, and had not only thoroughly established itself, but had become one of the commonest butterflies, whereas *P. oleracea*, an indigenous species, appeared to be rapidly declining in numbers, and it had been suggested that the introduced species was driving it out. He asked the opinion of the Fellows upon the three specimens, and suggested the possibility of their being the

result of natural hybridisation between *P. oleracea* and *P. rapæ*.—Dr. Dixey was of opinion that the three specimens in question were certainly not hybrids, and even probably only a variety of *P. oleracea*; he pointed out that they differed less from the *P. oleracea* exhibited than did the series of *P. rapæ* from one another.—Mr. W. J. Lucas showed three specimens of *Euborellia mæsta*, Génè, received on April 3rd from Hyères, from Dr. Chapman, with four others of the same species. Both sexes were shown; but they look rather alike owing to there being little difference in the callipers. *E. mæsta* is quite black. There are just the rudiments of elytra, but no wings. Antennæ dark fuscous, legs partly so, partly black. Mr. Lucas also exhibited a large ant, one of three specimens found this year at Swanage in a bunch of bananas, supposed to have come from Jamaica. The President observed that the specimen belonged to the genus *Neoponera*, and was probably *N. theresiæ*, Ford, a Central American species. He added that the genus was a curious one, combining the possession of a sting with the single abdominal node characteristic of the stingless ants.—Mr. F. Muir exhibited two specimens of the bat *Miniopterus schreibersi*, with female *Ascodipteron* embedded at the base of the ear. He also showed specimens and enlarged drawings of the male, female, winged and wingless, larva and puparium of the *Ascodipteron*, and read the following note:—"These all came from Amboyna (Dutch East Indies). The male and winged female hatch out as normal imagines, the female, after finding her host, cuts her way under the skin at the base of the ear, and then casts her legs and wings; her abdomen then develops to an enormous extent, and entirely envelops her head and thorax so that she appears as a 'bottled-shaped' grub without legs or head. The larvæ develop in the uterus in the usual pupiparous manner, and when full grown pass out through the vagina and fall to the ground, where they immediately pupate, hatching out as imagines in about thirty to thirty-one days. This species I have named *Ascodipteron speiserianum*, after Dr. Paul Speiser, the authority on this group of flies. I took another species in North Queensland, living on the same species of bat."—Mr. L. W. Newman exhibited, on behalf of Mr. G. B. Oliver, of Wolverhampton, a series of *E. hyperanthus* bred during January and February, 1911, from ova laid by a Leamington female in July, 1910. The specimens, though rather small, showed a great tendency to produce large spots both on the upper and under side.—Mr. H. J. Turner exhibited living specimens of a longicorn beetle, *Agapanthia asphodeli*, sent by Dr. Chapman from Hyères.—Commander Walker observed that he had found it in Malta (the only common longicorn there), and also at Gibraltar in the early spring, and always on asphodel.—GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 11th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited a long series of *Aplecta nebulosa* and its varieties; a bred series from *robsoni* male and *thompsoni* female which did not conform to the anticipated Mendelian proportions. Twenty-six per cent. were grey, forty-two per cent. *robsoni*, and thirty-two per cent. *thompsoni*, instead of fifty per cent. *robsoni* and fifty per cent. *thompsoni*.—Messrs. R. Adkin,

Harrison, Main, and L. W. Newman, hybrids of *Biston hirtaria* and *Nyssia zonaria*. It was stated that females had not yet been obtained in the cross *B. hirtaria* male and *N. zonaria* female. Mr. Adkin read detailed notes on the characteristics of the hybrid specimens shown by him.—Mr. Gough, specimens of the *arcte* form of *Aphantopus hyperanthus* from Kent and Surrey, together with intermediate and type forms.—Mr. Hugh Main exhibited a living female scorpion just received from the West Indies; it had two young on its back where, it was stated, the parent deposited them and where they usually remained two or three weeks.—Mr. W. West (Greenwich) called attention to the Society's collection of Coleoptera, which had now been completely reset and cleaned, and to which Messrs. Ashby and Ashdown had recently made numerous additions.—Mr. H. Moore, some Coleoptera received alive from the Orange Free State.—Mr. R. Adkin, a bred series of *Nyssia zonaria* reared from Wallasey, and called attention to the laying over of numerous pupæ for two winters, and to the much paler general coloration of a number of the specimens.—Mr. Blenkarn, the coleopteron *Myrmedonia funesta* and the ant it cohabited with, *Formica fuliginosus*, from Sandown.—
HY. J. TURNER, Hon. Rep. Secretary.

THE BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Entomological Section (late Birmingham Entomological Society).—*Jan. 16th, 1911.*—Mr. G. T. Bethune-Baker, President of the Section, in the chair.—The President referred to the great loss to entomological science by the death of Mr. J. W. Tutt. A vote of condolence with his family was passed, all members standing in their places.—Lepidoptera from Wicken Fen: Mr. Lloyd Chadwick exhibited *G. quercifolia*, *N. ziczac*, *N. dictæa*, *M. arundinis*, *M. flammea*, *C. phragmitellus*, *L. impudens*, *L. straminea*, *L. pallens* ab. *rufescens*, *C. senex*, *A. gemina* ab. *remissa*, *H. cribralis*, *T. hellmanni*, *H. auroraria*, *H. costestrigalis*, *C. sparsata*, *C. lemnalis*, *N. cilialis*, *A. advena*, *P. festuæ*.—Lepidoptera from Cornwall and Devon: Dr. Beckworth Whitehouse exhibited *Polianigrocincta*, *Dianthæcia barrettii*, *Heliothis peltigera*, *Epunda lichenea*, *E. nigra*, *Chariclea umbra*.—Lepidoptera from Henley-in-Arden: Mr. G. B. Manly exhibited *Trochilium bembeciformis*, *Drepana hamula*, *Xylophasia sublustris*, *Apamea ophiogramma*, *Hepialus sylvanus*, *Hybernia defoliaria*, *Himera pennaria*, *Trichiura eratægi*, *Notodonta dromedarius*, *Cirrhadia xerampelina*, *Cymatophora duplaris*, *Orthosia suspecta*, *Epunda lutulenta*, *Aplecta herbida*, *Tryphæna fimbria*.—Teratological specimens: Mr. G. T. Bethune-Baker exhibited the following: *Erebia melampus* with left hind wing short; *Melitæa athalia* with right hind wing short; *Erebia adlyte* with right hind wing about half size; *Erebia ceto* without a head—the specimen was swept off a flower and possibly the head had been seized by a spider; the insect fluttered quite briskly nine hours afterwards.—Mr. G. T. Fountain exhibited *Cheimatobia boreata* taken under leaves during frost, November 20th, 1910.—Mr. H. Willoughby Ellis, specimens of the scarce beetle *Cathormiocerus socius* from the Isle of Wight, May, 1910.

Feb. 30th.—Mr. G. T. Bethune-Baker, President of the Section, in the chair.—Mr. W. Bowater exhibited hybrids *Zonaria* × *hirtaria* bred from Yorkshire larvæ sent by Mr. J. W. H. Harrison. Those

bred from *Zonaria* male and *hirtaria* female were fertile and those from *Zonaria* female and *hirtaria* male were infertile. The hybrid females were semi-apterous.—Sir G. H. Kenrick gave a lecture on the Pierinæ butterflies, and explained the classification of the group. He described the various types of ova, larvæ, pupæ, and imagines, and also the food-plants and the structure of the antennæ and special scales occurring in certain species. The peculiar distribution and migration were explained, and the lecture was illustrated by a large series of specimens.—H. WILLOUGHBY ELLIS, F.Z.S., F.E.S., *Hon. Sec.*

RECENT LITERATURE.

A Handbook of the Tsetse-flies [Genus *Glossina*]. By ERNEST EDWARD AUSTEN, Assistant in the Department of Zoology, British Museum (Natural History). Pp. i-x, 1-110. Ten plates in colour. Printed by Order of the Trustees of the British Museum. 1911.

CHAPTER I. of this excellent and valuable work treats of the general characters of Tsetse-flies, and how they may be distinguished from other flies, especially members of the genera *Stomoxys* and *Hæmatopota*, with which species of *Glossina* might be confused. Distribution is also referred to, and a map of Africa with the "fly-belts" indicated thereon shows at a glance the infested areas. In chapter ii. (pp. 8-17) the external characters are discussed. Chapter iii. (pp. 18-22) mainly comprises tables of the groups and species. The other four chapters (pp. 23-105) are devoted to descriptions of the species, together with their distribution, bionomics, early stages (where known), affinities, and distinctive characters.

Newstead's arrangement of the species in groups has been adopted, except that *G. brevipalpis*, Newst., *G. longipennis*, Costi, and *G. medicorum*, n. sp., constitute a fourth group of the genus.

There are twenty-four illustrations in the text; the figures on the plates, which are beautifully reproduced, are from drawings by A. G. Engel Terzi.

Since the publication of Mr. Austen's 'Monograph of the Tsetse-flies' in 1903 there has been very considerable additions to our knowledge of these pests of Tropical Africa; also an increase in the number of described species. In the Monograph (now out of print) only seven species of *Glossina* were known, and *G. palpalis* had not then been recognized as the carrier of the parasite which causes "Sleeping Sickness." In the 'Handbook' under notice fifteen species of "Tsetse-fly" are dealt with, and two of these are described as new to science.

Up to a very recent date Trypanosomiasis had only been traced with certainty to the bite of *Glossina palpalis*. As our author points out, however, there is now reason to suspect that *Trypanosoma gambiense*, the parasite producing "Sleeping Sickness," may be conveyed by other species of Tsetse. It is therefore most important that medical officers and others engaged in fighting disease in Tropical Africa should be able to recognize the species of *Glossina* one from another. With this 'Handbook' at their service there should be little, if any, difficulty in the identification of Tsetse-flies.

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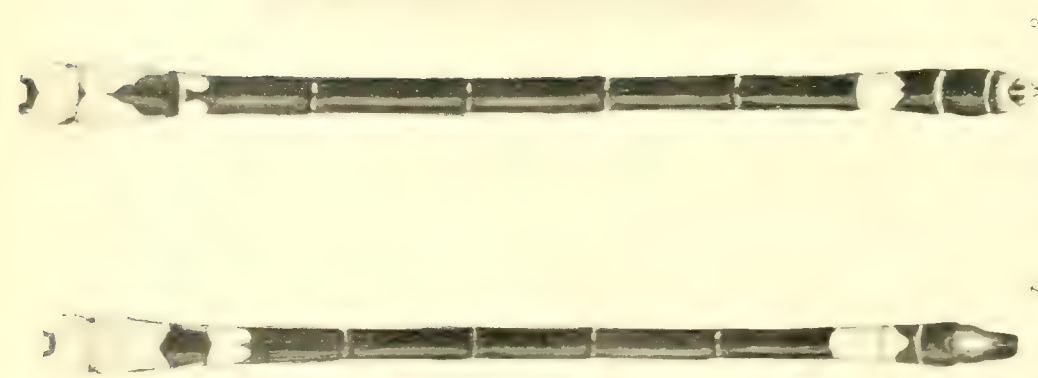
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West, Newman proc.

Drawings $\times 4$.



AGRION ARMATUM.

N.B. The makers of the block, from which the plate was printed, in attempting to improve, as they thought, the wing veining, have made it incorrect, and it must be ignored. W. J. L.

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NOTES ON BRITISH ODONATA IN 1910.

By W. J. LUCAS, B.A., F.E.S.

(PLATE VII.)

THOUGH I was not able to identify the species, I caught a glimpse of an Agrionid dragonfly in the New Forest on April 26th; but in spite of the fact that the season opened thus early, with the exception of Mr. G. T. Porritt's excursion to the Broads in search of *Agrion armatum*, little of interest has come to hand in connection with this order of insect during 1910. Mr. Porritt tells me that he found the species plentiful at one of the Broads and, if he had wished, could probably have secured a hundred specimens. He took six on May 26th, three on May 27th, and about a dozen on May 28th, the sexes being captured in about equal numbers. Unfortunately he did not discover the headquarters till the 28th, and then had only one and a half hours of sun, divided into two parts by a heavy storm; but the species was on that day quite abundant. The first captured was a blue-marked specimen, and, curiously enough, Mr. Porritt does not think he saw another, he therefore concludes it is a rare form. This specimen was of as bright a blue as that of *Agrion puella*, *Ischnura elegans*, or *Erythromma najas*. All the other specimens had brilliant green markings, except three teneral females (taken *in cop.* with adult males), which were very dingy. There is no mistaking these *A. armatum* amongst the *Agrion pulchellum*, *A. puella*, *I. elegans*, &c., with which they fly, their green bodies, shining like emeralds, making the insects very conspicuous. This bright colour unfortunately disappears rapidly as the dragonflies dry. Mr. Porritt found many dragonflies about, though it was somewhat early in the season. He enumerates:—*A. pulchellum*, *A. puella*, *Pyrrhosoma nymphula*, *E. najas*, *I. elegans* (abundant), *Libellula quadrimaculata* (in good force), *Brachytron pratense* (common), *Libellula fulva* (getting nicely

out, though still teneral, and evidently going to be common again).

On June 5th a large dragonfly, seen in Prince's Coverts near Claygate, Surrey, could not have been anything except *Anax imperator*. Here also were seen one or two *Libellula depressa* on June 12th, and a female *A. puella* on June 19th. At the Black Pond, in the same neighbourhood, on June 12th, *Pyrrhosoma tenellum* was taken in teneral condition, *Cordulia ænea* seemed fairly numerous, as also was *L. quadrimaculata*, while *A. imperator* was no doubt sighted more than once at a distance over the pond, and three of its empty nymph-skins were obtained. On June 19th, at the Pond, there were found:—*L. quadrimaculata* and its variety *prænubila*, *C. ænea*, *A. imperator* (numerous, one male being captured), *Calopteryx splendens*, *P. nymphula*, *P. tenellum*, and *Enallagma cyathigerum*. At the River Wey, near Byfleet, on June 26th, the dragonflies noticed were:—*C. splendens* (common), *I. elegans*, *Platynemis pennipes*, and *A. puella*, while an *E. naias* was almost certainly seen, but was not secured. An expedition for *A. imperator* to the Black Pond on July 3rd was unsuccessful, though several were seen.

Near Yarmouth, in the Isle of Wight, on August 11th, *Sympetrum striolatum*, *S. sanguineum*, *Æschna mixta* (one teneral male), *Æ. cyanea*, and *Lestes sponsa*, were met with; while on August 18th an *Ischnura elegans* was taken between Yarmouth and Thorley.

On September 4th, at Silverstream Bog, in the New Forest, *Sympetrum scoticum* was ovipositing by striking the water at random, the male being attached to the female *per collum*. The eggs were being dropped into the open watery holes in the bog, and it is there clearly that the nymphs must be looked for. I took one very teneral example of the species on this date.

Mr. N. P. Fenwick, Jr., reports:—On June 18th, *P. pennipes*, *I. elegans*, *A. puella*, and *B. pratense* (one seen) at the River Mole, Esher, Surrey; July 30th, an entirely bronze female of *P. tenellum* (variety *melanogastrum*) taken at the Black Pond, Esher; August 7th, one male *C. ænea* taken at the Black Pond, apparently the first recorded capture of the species in August; October 1st, a female *Æ. cyanea* captured in the garden at Esher. This capture of the bronze variety of *P. tenellum* is the first recorded for the Esher district and, I believe, for Surrey.

Mr. T. Thornton Mackeith says (*in litt.*, July 28th, 1910) that he captured *Æschna juncea* at Caldwell and Kilmacolm (identified by Mr. King); he also sent a female *E. cyathigerum* taken at Kilmacolm during the summer of 1910.

Kingston-on-Thames, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

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(Continued from p. 248.)

GANGLBAUER'S CLASSIFICATION.

Ganglbauer divides the Coleoptera into suborders characterised as follows :—

I. Suborder **Adephaga**.—Wing-venation of the first type. Testes simple, tubular. Male genital apparatus with only one pair of accessory glands (ectadenia). Ovaries with alternating nutritive and egg-chambers. Four Malpighian vessels. Larvæ orthognathous; campodeiform or only slightly departing from that form; with two-jointed tarsi.

One family-series. Families: Carabidæ, Dytiscidæ, Haliplidæ, Gyrinidæ, Rhysodidæ, Cupedidæ, Paussidæ.

II. Suborder **Polyphaga**.—Wing-venation of the second or third types. Testes compound, consisting of follicles. Male genital apparatus with one or more pairs of accessory glands. Ovaries with single terminal nutritive chamber. Four or six Malpighian vessels. Larvæ with long or short legs, having one-jointed tarsi, or without legs; campodeiform or eruciform; orthognathous, hypognathous, or pseudorthognathous.

1. FAMILY-SERIES STAPHYLINOIDEA.

Wing-venation of the second type, in some forms so reduced that the type cannot be recognized. Gular sutures not confluent. Pleural sutures of prothorax distinct.* Antennæ simple, or with the terminal joints thickened to form an unflattened club, occasionally irregular. Tarsi with a variable number of joints. Testicular follicles sessile. Male genital apparatus with two pairs of accessory glands (ectadenia and mesadenia). Four Malpighian vessels. Larvæ campodeiform, or not widely derivative therefrom, never grub-like or eruciform.

Families: Staphylinidæ, Pselaphidæ, Scydmanidæ, Silphidæ, Clambidæ, Leptinidæ, Platypsyllidæ, Aphænocephalidæ, Corylophidæ, Sphæriidæ, Trichopterygidæ, Hydroscaphidæ, Scaphidiidæ, Histeridæ.

2. FAMILY-SERIES DIVERSICORNIA.

Wing-venation of the third type, or approximating towards the second type, in some forms very reduced, and then without

* For *pleural* we should read *pleuro-sternal*, both here and in the following groups, in order that this character may be correct.—C. J. G.

recognizable type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ variously constructed. Tarsi with variable number of joints (five to one), exceptionally heteromericous, but then only in one sex. Testicular follicles sessile. Male genital apparatus with two or three pairs of accessory glands (ectadenia and mesadenia). Four or six Malpighian vessels. Larvæ campodeiform or derivative therefrom; ortho- or hypo- or pseudortho-gnathous; sometimes without legs; generally straight, seldom with curved body, like the cockchafer grub.

Families, provisionally arranged: Cantharidæ, Melyridæ, Cleridæ, Corynetidæ, Derodontidæ, Helodidæ, Dascillidæ, Chelonariidæ, Rhipiceridæ, Cebrionidæ, Elateridæ, Eucnemidæ, Throscidæ, Buprestidæ, Lymexylonidæ, Bostrychidæ, Anobiidæ, Lycidæ, Sphindidæ, Aspidiphoridæ, Ciidæ, Dermestidæ, Nosodendridæ, Byrrhidæ, Dryopidæ (=Parnidæ), Georyssidæ, Cyathoceridæ, Heteroceridæ, Hydrophilidæ,* Sphæritidæ, Ostomidæ (=Trogositidæ), Byturidæ, Nitidulidæ, Synteliidæ, Cucujidæ, Erotylidæ, Catopochrotidæ, Phalacridæ, Thorictidæ, Gnostidæ, Lathridiidæ, Mycetophagidæ, Adimeridæ, Colydiidæ, Endomychidæ, Coccinellidæ, ? Pseudocorylophidæ.

3. FAMILY-SERIES HETEROMERA.

Wing-venation of the third type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ generally simple, more rarely serrate, pectinate or flabellate, or with thickened club-like ending. Tarsi heteromericous, five-jointed in the front and middle legs, four-jointed in the hind pair. Testicular follicles sessile. Male genital apparatus with two or three pairs of accessory glands (ectadenia and mesadenia). As a rule six, exceptionally only four, Malpighian vessels. Larvæ hypognathous; generally with short legs.

Families, in provisional order: (Edemeridæ, Pythidæ, Pyrochroidæ, Xylophilidæ, Anthicidæ, Meloidæ, Rhipiphoridæ, Mordellidæ, Melandryidæ, Monommidæ, Nilionidæ, Othniidæ, (Egialitidæ, Lagriidæ, Petriidæ, Alleculidæ (=Cistelidæ), Tenebrionidæ, Trictenotomidæ.

4. FAMILY-SERIES PHYTOPHAGA.

Wing-venation of the third type. Gular sutures not confluent. Pleural sutures of prothorax distinct. Antennæ generally simple, less often serrate, pectinate, &c., or with thickened terminal joints, very rarely irregular. Tarsi crypto-pentamerous, *i. e.* five-jointed, with the fourth joint very small, firmly united with the fifth, and sometimes very indistinct, the first three joints with broad sole; rarely distinctly pentamerous and simple.

* See note at end of Classification.

Testicular follicles rounded and pedicellate. Male genital apparatus with only one pair of simple or forked accessory glands (ectadenia). Six Malpighian vessels.* Larvæ hypognathous or pseudorthognathous (Cerambycidae), with somewhat short, short or rudimentary legs, or without legs.

Families: Cerambycidae, Chrysomelidae, and Bruchidae.

5. FAMILY-SERIES RHYNCHOPHORA.

Wing-venation of the third type, or approximating to the second type.† Head generally elongated and snout-like. Gular sutures confluent. Pleural sutures of prothorax gone. Epimera united behind the prosternal process. Antennæ straight, or with elongate first joint and geniculate, the end joints then thickened and claviform. Tarsi crypto-pentamerous, and only exceptionally distinctly five-jointed, sometimes, as in the Proterrhinidae and Aglyceridae, which probably belong to this group, crypto-tetramerous or trimerous. Testicular follicles rounded, pedicellate. Male genital apparatus with variously differentiated accessory glands. Six Malpighian vessels. Larvæ hypognathous; with short legs or without legs; eruciform.

Families: Anthribidae, ? Proterrhinidae, ? Aglyceridae, Brenthidae, Curculionidae, Ipidæ (= Scolytidae).

6. FAMILY-SERIES LAMELLICORNIA.

Wing-venation of the third type, or by means of reduction approximating to the second type. Gular sutures separated. Pleural sutures of prothorax distinct. Antennæ with highly differentiated club. Legs highly differentiated; the front pair generally, by the structure of their tibiæ, adapted for digging. Tarsi five-jointed, quite exceptionally four-jointed. The front tarsi in many Coprophoga wanting in both sexes or in the male only. Testicular follicles rounded and pedicellate. Male genital apparatus with only one pair of accessory glands (ectadenia), exceptionally (*Cetonia*) with three pairs (one pair ectadenia and two pairs mesadenia). Four Malpighian vessels. Larvæ hypognathous, generally without ocelli, with thick curved body, and with legs.

One family: Scarabæidae.

Not long after this classification was published, Ganglbauer had to reconsider the position of the family Hydrophilidae, and he decided to withdraw it from the family-series Diversicornia,

* According to L. Dufour, *Donacia* forms an exception with only four of these vessels, and other exceptions will probably be made known when a sufficient number of the more primitive forms have been investigated.

† An obvious misprint, which I have corrected, occurs here in the original, the 2 and 3 being interchanged. It is copied by Grobben in his edition of Claus's 'Lehrbuch der Zoologie.'

and to recognize it as a distinct group in itself.* This group or family-series—the Palpicornia—he places between the Staphylinodea and the Diversicornia. The larvæ of many of the genera possess anal cerci, and from this he concludes that the group cannot be derived from any other, even the most primitive forms, existing amongst the Diversicornia; on the other hand, the imagines have the Cantharoidean type of wing-venation, hence the group cannot be merged in the Staphylinodea.

LAMEERE'S CLASSIFICATION (1903).

In this also the Coleoptera are divided into two suborders—the Adephaga and the Polyphaga.

The Adephaga are subdivided into two groups: the Cupediformia and the Carabiformia.

The Polyphaga are at first subdivided into two main sections or branches—the Cantharidiformia and the Staphyliniformia—corresponding with two of the three suborders of his earlier classification.

The Cantharidiformia are, as in that classification, further subdivided into ten groups or family-series, seven of which, taken together, are equivalent to Ganglbauer's single series—the Diversicornia. The Rhynchophora are not recognized as a separate family-series, but, as derivative from the Phytophaga, are merged in that series.

This classification is not so different from Ganglbauer's as it may at first sight appear. The division of the Polyphaga into two main branches, although not accepted by Ganglbauer in his classification, is quite in accordance with his views. For he admits of a Protostaphylinideon, from which the Staphylinodea are derived; and he admits also of a Protocantharideon, from which directly, he thinks, each of the other five groups of the Polyphaga, with the exception of the Rhynchophora, may be derived. And since he agrees with Lameere that the Rhynchophora are derived from the Phytophaga, he ought to have included both in one group as Lameere has done, or else found some other means of expressing this view in the classification. I am myself not convinced that the Rhynchophora are derived directly from the Phytophaga, nor do I think they are more distinct from the Chrysomelidæ than are the Longicorns. Probably all three have been derived independently from the same or very closely related ancestors; and I would suggest therefore the retention of the name Tetramera for the single large series, including the three minor groups: Longicornia, Phytophaga (in the old sense), and Rhynchophora.

(To be continued.)

* 'Käfer von Mitteleuropa,' Bd. iv. p. 151 (1904).

EURIPUS FULGURALIS, MATSUMURA.

BY A. E. WILEMAN, F.E.S.



THE type of this species, which is in the Taiho Ku Museum, North Formosa, was taken by Mr. Kikuchi at Hokuzancho, Horisha, Nantocho, Formosa, in May, 1908. It seems to be closely allied to *Euripus funebris*, Leech (Butt. China, Japan, and Corea, p. 150, pl. xvi. fig. 1), judging from a coloured drawing of the type kindly made for me by Mr. Kawa Kami, Director of the Taiho Ku Museum. The discal cell of the fore wings has two rather wide transverse crimson bars, instead of a longitudinal crimson streak as in *E. funebris*; and there is a narrow interrupted outer-marginal crimson band on the hind wings, becoming obscure towards the costa. On the under side of fore wings the crimson bars are placed as on the upper side, but they are somewhat narrower, and the first is irregular; there are no bluish marks in the cell or between the veins; on the basal area of the hind wing are six crimson spots, two of these are bar-like and placed in the cell, two others are above the cell and more or less in line with a confluent basal pair; the outer marginal crimson band is broader than on the upper side, more macular, and extended along the abdominal margin almost to the base of the wing. Expanse 86 millim.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 243.)

THE small cross nervules representing the secondary bifurcations of *iii*, and the junction of *ii*₅ with *iii*₁, and *iii*₃ with *iv*₄, and which form the outer edge of the discoidal cell, are amongst the most characteristic parts of the neururation of the fore wing both in shape and texture. They are very thick and strong in *varia* and *dictynnoides*, and almost as thick in *asteria* and *aurelia*; fairly thick in *athalia* generally, but rather variable in this species, thicker in *berisalensis* than in typical *deione*, in Swiss than in Italian *parthenie*, and in *dictynna* than in *britomartis*, though they are by no means thick in any of these; they are, indeed, very thin in southern *parthenie* and in *deione*, and in *britomartis* are so slight that they tend to melt away with the action of the chemicals used in denuding the wings of their scales—at any rate, in the case of those portions which belong exclusively to *iii*, which are always somewhat slighter than the rest, the thinnest part invariably being the upper fork of the lower branch of the obsolete *iii*. The junction of *iii*₁ with *ii*₅, when it exists, and that of *iii*₃ with *iv*₁, always points from the base upwards, generally sharply, though the former nervule in the case of *britomartis* makes a wide angle, sometimes quite a right angle. The other four nervules, which belong to *iii*, may be said normally to form a somewhat straggling W, a formation which is very clear in *M. merope*, and it is by the flattening of some of these lines and the extension of others that the characteristic differences in the shape of the discoidal cell are produced. I shall call these nervules “the W,” and speak of them as the first, second, &c., strokes of the W, counting from the costa downwards. The outer edge of the discoidal cell is flattest in *varia*, and most irregular in *parthenie*, but, though this is always true of the former, yet the degree of flatness or evenness varies. The first three strokes of the W are generally flattened out into an almost straight line, though the first two sometimes form the base of a U, and the fourth stroke makes with them an angle of only about 170°. The same formation obtains in *asteria*, except that a much sharper angle is formed by the fourth stroke, giving the effect of a slight peak at the lower outer corner of the discoidal cell. This peak is very distinct in *aurelia*, the first three lines being sometimes nearly straight, but the W sometimes very distinct, even in insects taken at the same time and place; the peak is sharper and even more distinct in *dictynnoides*, and the W sometimes plainer, the third stroke standing distinctly away from the first two, even if the former are rather a shallow U than a V. In *athalia* this peak is very

distinct, but the resemblance to a W ceases altogether in the male, though remaining in the female, the four strokes in the former being merely a slightly wavy line. *Dictynna* is slightly variable, but the first two strokes are generally distinct, the last two frequently so, but there is very little peak. In *britomartis* there is none at all; the four strokes form a rather straggling Greek ε. In *deione* the practical meeting of iii_1 and iii_2 almost entirely does away with the first two strokes, but the third and fourth are fairly distinct, and there is a small peak. In *berisalensis* these first two are represented by a short, straight, or curved line, and the peak is rather smaller. In *parthenie*, especially the more northern ones, the peak is very definite and acute, but the first three strokes are almost straightened out into one, the four forming a broad V rather than a W. The other nervures of the fore wing give no characteristics.

In the hind wing the short pre-costal nervure (marked *p* in the diagram) presents surprisingly marked characteristics on careful inspection. It forms a sharply defined angle with *i* at its point of departure, and this may be a right angle, or rather greater, or less. It forms, again, in most species another angle about the middle of its course, which again may be a right angle, or greater, or less; this latter angle, however, is not sharply defined, but generally slightly rounded, and I speak of it as greater than a right angle if the actual angle is so where the nervure bends, even if it afterwards approaches *i*. These two angles I refer to as (*a*) and (*b*).

In *asteria* (*a*) is a right angle, (*b*) is greater, no part of the nervure being approximately parallel with the costa; the second portion does not approach *i*, and stops well short of the costa. In *varia* both angles are slightly less than a right angle; a slight approach is made towards *i*, but in the female, and sometimes also in the male, the second portion is very long and nearly reaches the costa. In *aurelia* (*a*) is slightly greater and (*b*) slightly less than a right angle, the nervure is nowhere nearly parallel with the costa, but nearly touches it in the female. In typical *deione* the nervure starts at a right angle and then stops short. In *britomartis* it is the same, except that there is a very slight curve where the second portion should begin. In *dictynna* (*a*) is less than a right angle, and the whole nervure is then curved much like a scythe-blade. In *dictynnoides* it is much as in *dictynna*, but the curve is wider and shorter. In *berisalensis* (*a*) is a right and (*b*) an obtuse angle, and at the latter there is a short branch returning towards the base (see diagram). This is also present in *athalia*, but much less conspicuously so; both angles are slightly obtuse, but the second portion of the nervure curves inwards. In *parthenie* (*a*) is less, (*b*) greater than a right angle; there is no return branch, but a slight thickening at (*b*).

The only distinctions afforded by i and ii are that in *varia* and *aurelia* the former springs in a more upright position from the latter, and that in *asteria* ii is further from i and nearer to iii towards the base than in any other species.

The nervures of the hind wing which show most variety are iii_1 and iii_2 , but, on the other hand, they vary somewhat in the same species. In *varia* the stem appears to belong to iii_1 rather than to ii, as it really does, and to some extent this is also the case with *dictynnoides*, though in this species the formation tends towards that of *aurelia* (v. *infra*); it seems to belong equally to ii and to iii_1 in *aurelia*, *berisalensis*, and *britomartis*, and equally to ii and iii_2 in *deione*, *parthenie*, *athalia*, and generally in *dictynna*; only in *asteria* does it obviously belong to ii. In *aurelia* nearly always, and sometimes in *parthenie* and *athalia*, ii, iii_1 , and iii_2 branch off from the same spot; in *asteria* there is a short transverse nervule placed slantwise between ii and iii_1 , and a shorter and more perpendicular one joining iii_1 and iii_2 , though the latter is sometimes absent, iii_1 and iii_2 forking out from one another as they do in *athalia*, *parthenie*, *deione*, generally in *varia*, and sometimes in *dictynna*. In all these latter, and in *britomartis*, and occasionally also in *aurelia*, there is a transverse nervule of varying length, joining ii and iii_1 ; *varia* sometimes has iii_1 and iii_2 joined by a short, nearly perpendicular nervule, as in *asteria*, these two nervures being occasionally joined by a short, curved nervule in *dictynna*, and nearly always in *britomartis*.

Traces of the closing of the cell in the hind wing are to be found, in this group, in *asteria*, *varia*, *dictynnoides*, and more slightly in *aurelia*; this is always represented by a short spur rising from iii_3 near its point of departure from iv_1 (represented in the diagram, though it never occurs in *berisalensis*); and sometimes in *dictynnoides*, and generally in *varia* (as in some species of the other groups) there is a corresponding spur issuing downwards from iii_2 ; in one specimen of *varia* ♀ I have found these two spurs uniting so as to close the cell completely, as in the Argynnids and Brenthids;* on the other hand, I have found one *varia* ♂ devoid of either spur.

In *deione*, iii_3 branches off slightly nearer to the outer margin than in other species. In *varia*, iv_1 and iv_2 are parallel, and almost so in *asteria*, *deione*, *berisalensis*, and *athalia*, but diverge more in the other species, though the difference is not very noticeable.

Nervure α is decidedly convex in *parthenie*, slightly so in *athalia* and *dictynnoides*, slightly angulated (in a convex direction) near its inception in *aurelia*, *varia*, and *dictynna*, straight

* Notwithstanding Spuler's diagrams to the contrary, I have never so far found a Brenthid with the cell open. In *selene*, which he gives as an example with open cell, I have invariably found it closed.

in *asteria* and *deione*, straight or slightly convex in *britomartis*, and straight or slightly angulated in *berisalensis*. In *britomartis*, and much more markedly in *dictynna*, β is concave towards the disc; in *deione* and *berisalensis* it is first slightly concave and then slightly convex, being somewhat ogival in form; it inclines to convexity more or less in *parthenie*, and is nearly or quite straight in the other species.

As many of these distinctions are not to be observed without denuding the wings, and are, therefore, useless for the determination of specimens which are to be preserved for the cabinet, it appears to me useless at this point to attempt to place them in tabular form, which may, however, prove useful when treating of the phylogeny.

(To be continued.)

DRAGONFLIES OF THE NEW FOREST.

By W. J. LUCAS, B.A., F.E.S.

IN the Victoria History of Hampshire is to be found a list of the dragonflies of the New Forest; but as this list is much out of date a new one will probably be of use to entomologists visiting that interesting locality. As was to be expected in a large area that has always been to a great extent in a state of nature, where bogs as well as small ponds and streams are numerous, the dragonfly fauna is well represented. Of forty-two species which occur in the British Isles twenty-seven at least have been met with in the New Forest. *Oxygastra curtisii* has been recorded, but it is possibly the locality a few miles to the west that is intended. *Libellula fulva* is also found in this same locality, and has been taken at Ringwood (K. J. Morton, 1897), but a mile or two outside the Forest borders. Of those not yet recorded we might expect *Sympetrum vulgatum*; *S. fonscolombii* (casually); *Somatochlora metallica* (possibly); and the rest of the Agrionids known as British—*Lestes dryas*, *Erythromma najas*, *Agrion pulchellum*, *A. armatum*, and *A. hastulatum*. It may be that others are simply awaiting a discoverer to become British also.

1. *Sympetrum striolatum*.—Very common in late summer and autumn.
2. *S. flaveolum*.—A male was taken at Denny Bog by Major Robertson and given to me in 1900.
3. *S. scoticum*.—On boggy ground, the nymphs probably living in the watery spots in the bogs.
4. *Libellula depressa*.—A fairly common spring species, sometimes continuing into August.
5. *L. quadrimaculata*.—Like the last, an early species.
6. *Orthetrum cærulescens*.—Very common, probably breeding in the bogs in the same way as *S. scoticum*.
7. *O. cancellatum*.—Captured near Brockenhurst, June 26th, 1902

- (K. G. Blair), and once taken by myself in August in Dame's Slough Inclosure.
8. *Cordulia aenea*.—Reported by Mr. W. J. Ashdown, but apparently not common.
 9. *Gomphus vulgatissimus*.—At two streams in the south of the Forest.
 10. *Cordulegaster annulatus*.—A fine insect, common in the Forest, flying throughout the summer.
 11. *Anax imperator*.—This, the largest European dragonfly, seems to be fairly common. Though appearing in the spring, it extends into August.
 12. *Brachytron pratense*.—Near Beaulieu in 1900 (F. M. B. Carr).
 13. *Æschna mixta*.—Occasionally taken—the smallest and least common of the *Æschnas* of southern Britain.
 14. *Æ. juncea*.—As the previous species, met with occasionally; not easily distinguished on the wing from the following one.
 15. *Æ. cyanea*.—Fairly common in summer and autumn.
 16. *Æ. grandis*.—Not common in the New Forest. Mr. Clark (Ent. Record, vol. ii. p. 301) records it at dusk, and on August 3rd, 1901, I saw one at Oberwater.
 17. *Calopteryx virgo*.—Very common.
 18. *C. splendens*.—Occurring locally, but not common.
 19. *Lestes sponsa*.—At ponds, but perhaps not frequent.
 20. *Platycnemis pennipes*.—Common, especially along streams.
 21. *Pyrrosoma nymphula*.—Common, and on the wing for a long time. The form of the female (var. *melanotum*), with black-bronze abdomen, occurs.
 22. *P. tenellum*.—Very common, especially over the bogs. The forms of the female (vars. *melanogastrum* and *erythrogastum*), with black-bronze and crimson abdomens, respectively, are fairly frequent.
 23. *Ischnura pumilio*.—Common in a few localities in the south of the Forest, probably breeding in boggy ground. It was re-discovered there, June 3rd, 1900, by Mr. F. M. B. Carr and myself. The var. *aurantiacum* is frequent.
 24. *I. elegans*.—Fairly common and well distributed.
 25. *Agrion puella*.—Fairly common.
 26. *A. mercuriale*.—In several localities—common in some—appearing in the spring and remaining on the wing during the summer. It seems to like a stream running through a bog.
 27. *E. cyathigerum*.—Occurring, but apparently not very commonly.
- Kingston-on-Thames: July, 1911.

A NEW MOSQUITO FROM PARAGUAY.

BY E. H. STRICKLAND.

Janthinosoma paraguayensis, nov. sp.

♀. Head clothed on the vertex with yellow, upright, forked, and spindle-shaped scales, with deep violet scales at the sides. A few

yellow hairs project between the eyes. Palpi with blackish, somewhat outstanding scales and bristles. Proboscis with similar coloured closely appressed scales. Disc of thorax covered with blackish-purple spindle-shaped scales, lateral and posterior margins with yellow scales, which are most numerous on the anterior half of the mesonotum, where they form a more or less distinct lateral spot. Prothoracic lobes with a few cream-coloured scales and black hairs. Anterior and posterior femora, except for their apices and the posterior side, and the middle femora except for its apex, golden yellow. Coxæ with cream-coloured scales. Hind legs without very densely outstanding scales. Fourth hind tarsus white, last hind tarsus dark.

Wings dusky brown, with brown scales and veins. Hind cross-vein not less than its length from small cross-vein. Abdomen with white scales on the first segment and hind angles of all the other segments except the last one, reddish-purple scales on second segment, and dark purple on all remaining segments. Under side of all segments except the last with apical bands of white scales. First two segments golden yellow, with white scales all over. Length, 5.5 mm.

Habitat.—Pueto Max, Paraguay.

Season when found, January to April. Taken by Verzényi in 1905. Described from a single female.

Differs from *Janthinosoma varipes* (Coquillett) in that the disc of the thorax is entirely covered with dark scales.

South-Eastern Agricultural College, Wye.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. DISTANT.

Fam. BERYTIDÆ.

Hubertiella cardamomi, Kirk., J. Bombay N. H. Soc. xiv. p. 303, pl. A, f. 16, pl. C, f. 5 (1902); Dist. Faun. Brit. Ind. Rhynch. i. p. 424, f. 249 (1902).

Mr. E. E. Green has sent me varietal specimens of this species in which the two dark spots on the posterior pronotal lobe are almost or entirely obliterated. These specimens were taken from *Strobilanthus* sp., so that the species is seen to be not entirely confined to *Elettaria cardamomum*.

Fam. TINGIDIDÆ.

Genus SERENTHIA.

Serenthia, Spin. Ess. p. 168 (1837). Type, *S. atricapilla*, Spin.

Serenthia carinata, sp. n.

Head black, a little elevated between the eyes; antennæ brownish ochraceous, fourth joint apically black, first and second joints short,

distinctly thickened, second a little shorter than first; pronotum black, the anterior margin and the apical area behind the lateral angles, dull pale ochraceous, distinctly, centrally, longitudinally carinate for its entire length, coarsely punctate; elytra finely areolate, excluding costal area, black for about two-thirds from base, subcostal area shaded with ochraceous, margins of the areolets black, or piceous except on costal area where they are ochraceous; body beneath black; legs pitchy-brown. Long. 3 millim.

Hab. Ceylon; Ambalangoda Lake (E. E. Green).

Allied to *S. gibba*, Fieb., from which it structurally differs by the pronotum being distinctly longitudinally carinate for its entire length. Taken from *Juncus* sp. (E. E. Green).

HEGESIDEMUS, gen. nov.

Elongate, narrow; shortly spinous; eyes inserted at base of head and close to anterior margin of pronotum; antennæ with the first and second joints short and thickened, second globose, shorter than first, third long and slender, fourth incrassate, a little longer than first and second together; pronotum strongly longitudinally tricarinate, the anterior lateral margins moderately dilated, hyaline and areolate, an anterior hood not covering base of head and which is centrally strongly longitudinally carinate, the anterior pronotal area distinctly convex, the posterior area or process angularly narrowed; elytra elongate, discoidal area extending to about the middle of the elytra and with its margins distinctly raised, subcostal area somewhat narrow, costal area hyaline, areolate, broadest on apical half, sutural area long and very finely areolate, more broadly so at apex; legs of moderate length and slender.

Allied to *Teleonemia*, Costa, from which it principally differs in the dilated, areolate lateral margins of the pronotum.

Hegesidemus elianus, sp. n.

Head piceous, eyes black; antennæ brownish ochraceous, the apical joint piceous; pronotum with the anterior area castaneous, the posterior area piceous, the longitudinal carinæ and sometimes the hood, more or less ochraceous, the lateral dilated margins hyaline, areolate, the margins of the areolets fuscous; elytra black or piceous; the costal area hyaline and areolate, the areolets in two longitudinal series, their margins fuscous, the discoidal area either altogether piceous, or brownish ochraceous with the raised margins darker, the disk rugulosely punctate, costal area hyaline and areolate, the margins of the areolets piceous or fuscous, sutural area piceous and with an intermediate pale spot near apex; sternum black; abdomen beneath testaceous, the base and apex black; legs brownish ochraceous; elytra longly passing the abdominal apex; other structural characters as in generic diagnosis. Long. 5 millim.

Hab. Ceylon; Nuwera Eliya (E. E. Green).

Taken from *Strobilanthus* spp. (E. E. Green).

Dr. Horváth (Ann. Mus. Nat. Hung. ix. p. 337), among some other proposed synonymy which will subsequently receive atten-

tion, has stated:—" *Galeatus*, Curt., Ent. Mag. i. p. 196 (1833) = *Cadmillos*, Dist., Ann. Soc. Ent. Belg. liii. p. 113 (1909); *id.* Faun. Brit. Ind. Rhynch. v. p. 107 (1910).

I have figured both these genera, and given differential structural characters, and must be content to leave these figures and descriptions to speak for themselves.

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

Aracima serrata, sp. n.

Fore wings greenish yellow; crescent at outer end of the cell, and postmedial line dark purplish; the line bluntly serrated, indented above dorsum. Hind wings greenish yellow; postmedial line purplish, diffuse towards the costa, where there are clusters of purplish dots on each side of the line. Fringes of all the wings purplish. Under side yellowish, markings as above; the hind wings rather paler than the fore wings.

Expanse, 44 millim.

A male specimen from Rantaizan (7500 ft.), May 10th, 1909. Collection number, 1824.

Alcis arizana, sp. n.

Fore wings brownish with a faint purplish tinge, finely sprinkled with black atoms; ante- and postmedial lines black, the first indistinct, bluntly angled below costa, the second almost parallel with termen, bluntly serrate; space between lines paler, almost whitish; discal mark dusky. Hind wings similar in colour to median area of fore wings; postmedial line blackish, curved, and tapered towards the costa. Fringes preceded by a brown crenulate line. Under side of fore wings hardly paler between lines; a pale apical patch and smaller pale patch below middle of terminal area; lower two-thirds of postmedial line on hind wings double.

Expanse, 36 millim.

One example of each sex from Arizan (7500 ft.), September, 1906.

Collection number, 797.

Alcis brevifasciata, sp. n.

Fore wings ochreous brown; ante- and postmedial lines represented by black dots on the veins, each line from a blackish spot on the costa; basal patch blackish; discal spot black, oval, a diffuse spot above it on the costa; subterminal line whitish but not clearly defined, passing through blackish clouds at apex, above middle, and at tornus; area beyond the line powdered with blackish, black bars between veins in upper part. Hind wings ochreous brown, paler on costal area; a broad blackish central band, not extended to costa, enclosing black discal dot; terminal area barred with blackish as on

fore wings, and clouded with blackish towards tornus; traces of a pale subterminal line. Fringes preceded by an interrupted line of black lunules. Under side ochreous brown, powdered with blackish; all the wings have a black discal spot, and a dentate postmedial line also blackish.

Expanse, 34 millim., ♂; 36 millim., ♀.

A male specimen from Arizan (7500 ft.), September, 1906; and a female from the same locality, August, 1908.

Collection number, 800.

Hemerophila cuneilinearis, sp. n.

♂. Pale cinnamon-brown, striated and mottled with darker. Fore wings with two pale-edged blackish lines, the antemedial which is sinuous, bidentate towards the costa, commences near middle of costa, and terminates on dorsum at one-fourth from base; the postmedial is acutely angled below the costa and from this angle a blackish streak runs to termen below apex, the middle of the line is bent inwards towards the antemedial; space enclosed by lines greyish. Hind wings finely striated with blackish on basal two-thirds; outer third suffused with reddish brown; postmedial line blackish, slender, sinuate, internally edged with whitish; subterminal line pale, outwardly edged with dark brown, wavy. Under side pale greyish brown, speckled with dark brown and blackish; all the wings have a black discal spot at end of cell, and a series of black dots representing postmedial line.

♀. Similar to the male, but the central third of fore wings is suffused with blackish, and the ante- and postmedial lines are consequently obscured; the black striation on hind wings is heavier.

Expanse, 46 millim.

One example of each sex from Kanshirei (1000 ft.). The female obtained in May, and the male in June, 1908.

Collection number, 798.

Allied to *H. subplagiata*, Walk.

(To be continued.)

BY THE WAY.

“NOTICE.—Sugaring on Trees is Prohibited. By Order,” is a legend erected high on a venerable oak of Queen’s Bower, in the New Forest, and probably unique among the many warnings to wanderers throughout the world. We remember that Herbert Goss had something to say respecting the legality of a prohibition which could relate to damage only in so far that lepidopterist sugar might be supposed to disfigure trees. However the law may run, it is certain that permission to sugar has, we are told, been categorically denied recent applicants by Mr. Lascelles, and that the keepers have orders to “clay” all fresh treaclings. During the festivities of last month entomologists foregathered about Brockenhurst and Lyndhurst, but the cold winds of the

preceding weeks rendered notable captures scarce and we (who were not looking for them) saw no uncommon Lepidoptera, among which *Tortrix viridana* swarmed everywhere on oak and was equalled in number only by vast hordes of *Orchestes fagi* on beech, the leaves of which were turned half brown by their ravages. *Osmylus* was netted; *Anoploclera* unusually common about Holland's Wood; and *Asemum* found on fir-posts; but *Anthaxia* was not seen when the May blossom was over. We want an entomological guide to the Forest badly; Hutchinson's book mentions only a few species and terms *Cicadetta*, which is by no means uncommon locally this season, "*Cicada hæmatoides*"; the Victoria History list is peculiarly poor in the less worked groups.

On the contrary, Brandon in May afforded capital collecting, and we have never, during fifteen years, seen insects of all Orders so abundant there. The Staunch and its carr were unusually dry for the time of year, yielding *Hebrus ruficeps*, *Plociomerus fracticollis*, *Chrysomela graminis*, and larvæ of *Sesia bembeciformis*; beetles, though not *Diastictus*, occurred plentifully at the latter locality, with such things as *Trox sabulosus* (seventy were counted in rabbits' fur), *Onthophilus sulcatus* (in rabbits' holes), *Aphodius constans*, and *Cistela luperus*. About Lakenheath *Phyllobius viridicollis* was in great numbers, with a few *Trigonometopus frontalis*. Some sixteen kinds of sawflies and about forty *Parasitica* turned up in a few days. Brandon and Tuddenham Fen, where we also did well, should be more patronised by entomologists; the 'White Hart,' at the former, is a capital inn, whence all the best spots are easy of access.

C. M.

NOTES AND OBSERVATIONS.

GYNANDROUS *LYCÆNA ICARUS* (ALEXIS).—I should like to record in the 'Entomologist' the capture, on June 9th, near Boscastle, in North Cornwall, of a perfect gynandrous specimen of *Lycæna alexis*, left side male, right side female. I should also like to record the capture, in my garden here, of a number of specimens of *Apamea ophiogramma*.—L. F. HAMMOND; 17, Foxley Gardens, Purley, Surrey, July 7th, 1911.

APATURA IRIS, &c., IN HASLEMERE DISTRICT.—While out for a stroll some three miles from Haslemere town, on Tuesday morning last, the 11th inst., I was surprised by a fine male *Apatura iris*, which suddenly appeared in a woodland path along which I was walking: it settled about six yards in front of me, in a slightly damp place on the path. By carefully approaching, I was successful in netting it. In the same locality I saw a nice sprinkling of *Limenitis sibylla*, as well as a number of *Argynnis paphia*.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere, July 13th, 1911.

CYANIRIS ARGIOLUS.—I took a specimen of *C. argiolus* this morning; surely this is remarkably early for the second brood, although in such weather almost anything is possible, I suppose! —B. E. J.

ZYGÆNA FILIPENDULÆ ab. FLAVA IN SURREY. — On July 16th, 1911, I had the very good luck to take a fine specimen of *Zygæna filipendulæ* ab. *flava* at rest on a flower-head of devil's-bit scabious at Coulsdon, Surrey.—J. ST. AUBYN; "Tregotham," Endlesham Road, Balham.

RETARDED DEVELOPMENT ON EMERGENCE OF CHESIAS RUFATA (OBLIQUARIA).—On June 18th, at 8 p.m., a specimen of *Chesias rufata* (*obliquaria*) emerged in one of my cages. As its wings had not seemingly begun to develop when I went to bed, I concluded that the pupa had been kept too dry and that the insect would be crippled. Of this I felt certain when I found it in exactly the same condition at 7.30 the next morning. To my surprise, however, at 9 a.m. it was fully developed, and in proper condition. I remember seeing a note of a somewhat similar case, but cannot find the entry. —(Rev.) J. E. TARBAT; The Vicarage, Fareham, Hants.

NOTE ON LARVÆ OF MERODON EQUESTRIS, F.—Not without some regret I write to inform your readers and Mr. F. J. Chittenden of another bulb attacked by these larvæ. Last winter four or five bulbs of *Hippeastrum* in my greenhouse were found to be infested with fair-sized grubs which I at once suspected to be *Merodon*; so to make sure, they were placed in a breeding-cage, and this spring over a dozen imagos made their appearance. Fortunately my bulbs were not very costly ones, but considering the high prices paid for fine varieties, the loss caused by a single female might be serious. Curiously enough, the specific name of this plant is "*equestre*," and of the fly, "*equestris*." —FREDK. C. ADAMS; Fern Cottage, Lyndhurst, June 22nd, 1911.

PHRYXUS (DEILEPHILA) LIVORNICA IN SUSSEX.—A female specimen of the Striped Hawk-moth was taken here on Sunday, July 2nd, and I should say by her appearance she had not been out of chrysalis very long; she, however, laid about nine eggs in the bottle in which she was kept for the night. I have the insect in my possession, on the setting-board, sorry to say, slightly damaged at tip of fore wings. I have written to you, as I do not think a specimen has been recorded from this district before.—ERNEST STREETER; Church Street, Petworth, July 6th, 1911.

PHRYXUS LIVORNICA IN CORNWALL.—A specimen of the Striped Hawk (*Phryxus livornica*) was recently sent to me by a friend, who got it near Newquay, Cornwall, on June 27th.—R. R. WATERS; 1, Hillmorton Road, Rugby, July 23rd, 1911.

LEPIDOPTERA AT LIGHT.—The arc lamps in York in early June seem to have proved very attractive to moths, for I found a very large number on the pavements in the town. These included *Acronycta* (*Jochæra*) *alni* (2), *D. chaonia*, several of the dark *Acronycta rumicis*, *Eurymene dolobraria* (2), and a rather good specimen of

Spilosoma lubricipeda var. *zatima*. Species of *Plusia* were strongly attracted, and I found under a couple of lamps *P. pulchrina*, *iota*, *chrysitis*, *gamma*, and *Abrostola triplasia*. While *Dicranura vinula* was very abundant, the specimens were practically always female, and these females seemed to wish to lay the instant they were boxed. I had always supposed that only male specimens of the Notodontidae were attracted by light. In breeding *Petasia nubeculosa* this year from the egg, I was much struck by the large variety of food-plants which it readily eats. I first experimented with the plants growing in the locality where the parent was obtained—sallow, aspen, bilberry, and dock—the first two of which it seemed at times to prefer to birch. It also ate heather, and I found that it would take greedily lime, ash, hawthorn, willow, alder, plum, strawberry, &c.; probably it is as omnivorous as *P. cassinea*. This does not seem to have been generally recorded, though I am told that Barrett has remarked on its eating other food besides birch.—C. MELLOWS; Bootham School, York.

CARNIVOROUS FEEDING OF PLATYCLEIS BRACHYPTERA.—On July 3rd Mr. R. South was good enough to give me three living Orthoptera, which he had obtained two days previously while trailing his net over the heather at Oxshott, Surrey. One of them was *Gomphoceris maculatus*, and the others were undeveloped females of a species of Locustidae. One of the Locustids had undergone a moult in the glass-bottomed box in which it was enclosed, and when I looked at it again, I found that it had eaten its own cast skin. On reaching home, I turned out all three specimens into a good-sized fish-globe, and kept them regularly supplied with fresh grass, upon which they fed readily. After the lapse of several days, however, the *Gomphoceris* was noticed to be getting very sluggish in its habits, and the next morning it was found to be dead and partly consumed; later on, one of the Locustids was actually observed to be eating the body greedily. Mr. W. J. Lucas, who kindly examined one of the Locustids for me, stated that it might safely be regarded as *Platyceleis brachyptera*, as that species was known to occur at Oxshott, and as *P. roeselii*, the only other species to which it could possibly belong, had not been recorded from that locality.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, July 21st, 1911.

LEPIDOPTERA OF THE BRECKSAND DISTRICT.—In the 'Entomologist' for March (vol. xlv. p. 111) appeared an interesting note on the Lepidoptera of the Brecksand district, near Tuddenham, in Suffolk, by the Rev. J. E. Tarbat. It may be of interest to supplement this by an account of a brief visit to the same locality paid by me this year from June 13th to 16th. I have often before worked this district by day, and, indeed, accompanied Mr. Tarbat on one occasion last year, but have not previously been able to do any night collecting there. The weather was cold, windy, and overcast, which may account for the absence of *Acidalia rubiginata*, and *Agrophila trabealis*, both of which I took on the same dates last year. Sugar was a complete failure, and the following list represents almost entirely the species captured by working hedgerows, rough fields, &c., with a lamp between dusk and moonrise. Considering this and the

very unfavourable weather, the results are not unsatisfactory. *Lithostege griseata* was taken, both by beating herbage during the day and during its flight at dusk, and was in fine condition. It is, in my experience, never abundant, and very local. I flushed a single specimen from a small patch of waste land round a haystack on each of three days—June 1st, 14th, and 15th—all fresh and perfect. Certainly it emerges at intervals over a long period, as on the night of June 15th I took a female drying its wings after leaving the pupa. Besides this, the following insects were seen or taken:—*A. psi*, *L. comma*, *L. pallens* (very abundant), *X. rurea* (one fine whitish-grey form), *X. lithoxylea*, *N. saponaria*, *M. sordida*, *M. albicolon* (the Brecksand form is consistently darker than the usual coast type), *C. morpheus*, *R. tenebrosa*, *A. vestigialis* (quite a typical form), *A. segetum*, *A. exclamatoris*, *N. festiva*, *D. capsicola*, *D. carpophaga* (pale buff-coloured), *H. serena* (common on fir-trunks), *A. advena*, *H. tripartita*, *P. gamma*, *P. iota*, *P. chrysitis*, *H. uncula* (a single specimen in marshy ground), *B. repandata* (darker and less grey than the Cambridge form), *E. pendularia*, *C. exanthemaria*, *B. taminata*, *P. flavofasciata*, *C. bilineata*, and *T. variata*. Geometers, save for the last-named, were very scarce. It is certainly a most interesting district, and further study of its peculiar fauna seems likely to prove scientifically valuable.—(Rev.) C. E. RAVEN; 4, Park Terrace, Cambridge.

THE ENTOMOLOGICAL CLUB.—A meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 10th, 1911, Mr. Geo. T. Porritt in the chair. Mr. Robert Adkin (O.M.) and Messrs A. H. Jones (H.M.), A. Sich (H.M.), and nine other visitors were present.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, May 3rd, 1911.*—The Rev. F. D. Morice, M.A., President, in the chair.—The President announced the death of two Fellows of the Society, the Rev. Canon Cruttwell, and Mr. W. A. Rollason. He then informed the Society that the authorities of the Science Museum had persuaded the Government to allow them to take a portion of the land belonging to the Natural History Museum at South Kensington for the purpose of erecting new buildings of their own, thereby precluding much-needed additions to the Natural History Museum, especially in the Entomological Department, and on the motion of Mr. G. T. Bethune-Baker, seconded by Dr. Dixey, a protest was unanimously passed by the Society, the position being explained by both mover and seconder, and further comments being made by Mr. C. O. Waterhouse and the Rev. G. Wheeler on the disastrous results of such a proceeding to the Natural History Museum. Mr. H. Rowland-Brown then moved that "If a deputation be appointed to wait on Mr. Runciman with regard to this matter, the Officers and Council of the Entomological Society desire to be represented on it." This was seconded by Mr. Bethune-Baker and carried unanimously.—Commander J. J. Walker exhibited, on behalf of Mr. Geo. Brown

of Coatbridge, Lanarkshire, living specimens of *Helophorus tuberculatus*, Gyll., hitherto exceedingly rare as a British insect. These were taken by Mr. Brown at the end of April, walking about on bare dry peaty soil on the moors near Coatbridge.—Mr. O. E. Janson, a new and remarkable Lamellicorn beetle, belonging to the *Cremastochilides* group of the Cetoniidae, in which the anterior tarsi were unmistakably six-jointed. He believed this was the first known instance in the whole of the Coleoptera where the tarsal joints exceeded five. The specimen was received from Uganda. Mr. C. O. Waterhouse suggested that it was probably an abnormal specimen, six-jointed tarsi being so far unknown in entomology. Mr. G. C. Champion expressed concurrence in this opinion.—Mr. A. Harrison, a drawer of Delamere Forest *Aplecta nebulosa*, bred last year from var. *robsoni* male and var. *thompsoni* female, by himself and Mr. H. Main. Only fifty moths were bred, 26 per cent. of the grey form, 42 per cent. of *robsoni*, and 32 per cent. of *thompsoni*. This result quite negatives the idea that the form *robsoni* was a heterozygote or hybrid (so-called), and that the grey form and *thompsoni* were homozygotes or pure. All the previous results pointed to this conclusion, but the results obtained last year show that the problem is not so simple as this, and that it will require further experiments before it can be solved.—Mr. Donisthorpe, three females of *Lasius mixtus*, Nyl., a race of *L. umbratus*, Nyl., and a female of the latter for comparison. He remarked that there were only two previous records of its capture in Britain. One of his specimens was taken at Weybridge last year, and another at Mickleham, in company with Mr. Crawley, where they each took a specimen last month. The third was captured this year by Mr. Dollman in Richmond Park.—Mr. H. Rowland-Brown brought for exhibition examples of *Agriades thetis* (*bellargus*) ab. female *caelestis*, Obthr., taken last August at Dom-pierre-sur-Mer, Charente-Inférieure. He said that, so far as is known at present, this brilliant form of the blue female is confined in western Europe to the west and south-west of France; roughly speaking between the valley of the Loire and the Gironde, where it occurs locally not unfrequently; the blue form of *A. coridon* female, var. *syngrapha* also being found in the same calcareous region.—Mr. G. W. V. de Rhé-Philipe exhibited and described several new Indian butterflies, viz., *Euplea mulciber* var. *duarseri* male, *Charaxes raidhaka* male, *Euripus consimilis*, new female dimorphic form *torsa*, *Cyaniris parishii* male, *Nacaduba ardates* var. male *dima*, and new aberration of *Terias silhetana*.—Mr. H. M. Edelman exhibited three generations of *Hybernia marginaria*, being the result of a pairing between a dark male and female taken wild in Epping Forest in 1908. The 1909 brood did not vary much from the parents. The 1910 brood produced specimens with dark margins and three unicolorous males. The 1911 brood produced specimens with lighter margins and dark interiors, but no unicolorous specimens. The darkest males and females were paired in each case. These dark forms have only appeared in Epping Forest the last few years.—Mr. G. C. Champion sent round living specimens of *Corymbites purpureus* and *Morimus lugubris*, taken by Dr. Chapman at Amélie-les-Bains, Pyrénées Orientales.—Mr. L. W. Newman showed a stick of *Salix*

caprea containing larvæ supposed to be those of the "Wood Wasp." He pointed out that the larvæ make caps like *Ægeria andrenæformis*, and that the cocoon is exactly like that of a "clear wing," and the workings very like those of *Ægeria*. A discussion arose on this exhibit, in which widely different views were expressed even as to the order to which the larvæ in question belonged.—Mr. A. G. Scorer exhibited a specimen of *Hyloicus (Sphinx) pinastri*, of whose British origin he had no doubt. It was caught near Aldeburgh, and another specimen was taken at the same time. He also exhibited a gynandromorphic specimen of *Gonepteryx rhamni*, taken by himself at Salisbury, on September 2nd, 1894. It was evenly divided, the right side being female and the left male.—Dr. K. Jordan exhibited some insects from India in one of Mr. Newman's relaxing boxes, which had remained throughout their journey as fresh as if just captured, and were in perfect condition for setting. He also exhibited the Saturniid moth, *Dysdemonia kadeni*, in its resting attitude. The hind wings are for the greater part concealed under the fore wings, only the anal area and the tail projecting. The abdomen being bent towards the left side, the insect in this attitude resembles a crumpled dry leaf, and recalls the much smaller Bombycid—also exhibited—*Sorocaba anomala*, which, as is well known, assumes a similar attitude when at rest. He further exhibited a species of *Cosmosoma*, family Syntomidæ, partly covered with a white wool. According to the collector (A. H. Fassl), "the insect when touched ejects from a fold on the under side of the abdomen a white wool, which completely envelops the specimen." The hitherto unknown female of *Ogyris meeki*, Roths., a Lycænid from New Guinea, was likewise shown, together with the male and several *Hypochrysops*.—Mr. Hawkshaw exhibited several drawers of Lepidoptera, beautifully arranged and set, placed on squared paper, and with the written history of every insect accompanying it. He explained that the drawers were all interchangeable and were arranged perpendicularly like books, instead of horizontally as usual.—Commander Walker communicated the following papers:—"Some African and a few Australian Aculeate Hymenoptera in the Oxford Museum," by the late Col. Bingham, with a prefatory note by Prof. Poulton; communicated by Rowland Turner. "A Contribution to the Life History of *Hesperia (Syrichthus) sida*," by Harold Powell. "Biological Notes on Indian Pierine Larvæ," by Capt. Frazer.

RECENT LITERATURE.

Our Insect Friends and Foes. By F. MARTIN DUNCAN, F.R.P.S. Pp. i-xi. and 1-296. Sixteen Plates. London: Methuen & Co. 1911.

IN the sixteen plates Mr. Duncan has presented us with some very fine photographs, relating chiefly to well-known insects. The text too is interesting reading, but it lacks the charm of novelty—we seem to have met with so much of it before, Fabre and others

having been drawn on to a great extent. Sufficient reasons are given for including Arachnids in the work, although the title speaks of insects only. The classification of the insects we are bound to state is very inadequate and out-of-date. One would like to see technical terms (*e.g.* pollination, fertilization, animal, nymph) used with a definite meaning. The last, for instance, is now usually applied to the whole stage between ovum and imago of insects, such as dragonflies, with little post-embryonic development. The book has not been at all well seen through the press, the slips in spelling and solecisms in expression being numerous. In a few places errors and questionable statements have crept into the matter.

W. J. L.

1. *Fortieth Annual Report of the Entomological Society of Ontario*. Many Illustrations. Ontario. 1909. As usual, full of useful information, chiefly in connection with economic entomology.
2. *Nota sobre el Dilar parthenopaeus, Costa*. By L. Navás. (Anuario del Museo Zoologico della R. Università di Napoli.) Pp. 1-4, with fig. Feb. 1910.
3. (i.) *Über die Biologie von Glyphotaelius punctato-lineatus, Retz. nebst Bemerkungen über das freilebende Puffenstudium der Wasserinsekten*. By Dr. C. Wesenberg-Lund. (ii.) *Über die süßwasserbiologischen Forschungen in Dänemark*. By Dr. C. Wesenberg-Lund. (iii.) *Natural History of the Larvæ of Donaciinae*. By Adam Giede Böving. Pp. 1-108, with seven beautiful plates. (iv.) *Beiträge zur Biologie der Wasserwanze: Aphelocheirus montandoni, Horvath*. By Hj Ussing. (Sonderabdruck aus Internationale Revue der gesamten Hydrobiologie und Hydrographie.) 1910.
4. *A further Contribution towards the Knowledge of the Panorpidæ*. By T. Miyake. Pp. 183-205, with plate. (Journal of the College of Agriculture, Imperial University of Tokyo.) Tokyo. April, 1910.
5. *The Mantispidae of Japan*. By T. Miyake. Pp. 213-227, with plate. (Journ. Coll. Agric. Imp. Univ. of Tokyo.) Tokyo. April, 1910.
6. *Neurópteros chilenos*. By L. Navás. Pp. 335-241, with fig. (Revista chilena de Historia Natural.) June, 1910.
7. *Névroptères des bords de la Meuse et de la Molignée (Namur)*. By L. Navás. (Revue de la Société entomologique de Namur.) Oct. 1910.
8. *Crisópidos (Ins. Neur.) nuevos*. By L. Navás. 20 pp. Illus. S. Fiel. 1910.
9. *Annual Report of Christ's Hospital Natural History Society*. Horsham. 1910. Amongst the contents of this excellent report is a local list of the Lepidoptera.
10. *Über Bernsteineinschlüsse im allgemeinen und die Coleopteren meiner Bernsteinsammlung*. By R. Klebs. Pp. 217-242. 1910.
11. *Palaeopsylla klebsiana*, n. sp. By Dr. Alfons Dampf. 12 pp. with two plates. 1910.
12. *Übersicht der Libellen Mitteleuropas (Libellen-Kalender)*. By

- Wilhelm Leonhardt. Pp. 1-19. (Sonder-abdruck aus dem Entomologischen Jahrbuch für 1911.)
13. *A Preliminary Revision of the Labiduridæ, a Family of the Dermaptera* (Orthoptera). By M. Burr, D.Sc. Pp. 161-203, with two plates. (Ent. Soc. Lond.) 1910.
 14. *Dermaptera of Seychelles* (Orthoptera). By M. Burr, D.Sc. Pp. 123-133. Illus. (Trans. Linn. Soc.) 1910.
 15. *Note sur la Distribution en Angleterre du Forficula lesnei, Finot* (Orthoptera). By M. Burr, D.Sc. Pp. 121-3. (Bull. Soc. Ent. France.) 1911.
 16. *On some South African Dermaptera (Earwigs) in the South African Museum (Cape Town)*. By M. Burr, D.Sc. Pp. 17. Illus. (Annals of the South African Museum.) June 15th, 1911.

W. J. L.

Proceedings of the South London Entomological and Natural History Society, 1910-11. With nine plates. Pp. i-xvi.; 1-175. Published at the Society's Rooms, Hibernia Chambers, London Bridge, S.E.

ALL but one of the ten papers in this valuable publication treat of entomology. In "The Lepidoptera of a London Garden" (pp. 1-12), Mr. Robert Adkin presents an annotated list of the moths and butterflies he has observed in the garden of his residence at Lewisham since 1880. Mr. Adkin also contributes "Notes on *Hepialus humuli* and its Shetland forms" (pp. 13, 14), in which he protests against the continued use of *hethlandica*, Staud. for the Shetland race of *humuli*, which Newman in 1865 named *thulensis*.

An exceedingly useful contribution by Mr. Alfred Sich is entitled "Larval Legs" (pp. 15-17).

"A Few Days with the Butterflies of Zermatt" (pp. 18-26), by Mr. Hy. J. Turner; "The Butterflies of Sicily" (pp. 27-38), by Mr. J. Platt Barrett; and "An Entomological Trip to South Brazil" (pp. 54-65, plates iii. and iv.), by Mr. W. J. Kaye, are all very interesting.

A highly important paper by Dr. T. A. Chapman, "On Insect Teratology" (pp. 39-53, plates i. and ii.) must be studied by everyone in any way interested in the subject. Those who incline to the study of our native species of Neuroptera should make a point of reading "The Natural Order of Insects—Neuroptera" (pp. 66-73, plates v. and vi.), by Mr. W. J. Lucas.

In "Notes on the Glow-worm" (pp. 74-76, plates vii. and viii.), Messrs. R. A. R. Priske & H. Main give interesting details concerning the early stages of *Lampyrus noctiluca*.

Neuration of Lepidoptera is discussed at some length in the "Annual Address" (pp. 77-93) by the President, Mr. W. J. Kaye.

The plates are from excellent photographs by Messrs. F. N. Clark (i. ii.), E. Dukenfield Jones (iii. iv.), W. J. Lucas (v. vi.), H. Main (vii. viii.), and E. Slip (ix.); all are exceedingly well reproduced.

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THE ENTOMOLOGIST

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[No. 580

FOUR NEW PTEROPHORIDÆ.

By T. BAINBRIGGE FLETCHER, R.N., F.E.S., F.Z.S.

(Published with the sanction of the Inspector-General of Agriculture in India.)

THE following descriptions of new Pterophoridae were drawn up two years ago whilst working through the National Collection of Plume-moths, and, as I have already had occasion to refer to one species under its manuscript name (Trans. Ent. Soc. 1910, p. 141), and since the types are standing in the British Museum Collection under the names then given to them, it seems desirable to publish the descriptions.

The first three species have been placed more or less provisionally in the genus *Oxyptilus*, Z., but there is no doubt that this genus contains at present a very heterogeneous collection of exotic species, and that it will require subdivision in the near future. In the meantime, and until we have a larger knowledge of exotic forms, it seems premature to attempt to break it up, more especially as the number of species contained in it is at present moderate (about thirty).

The fourth species belongs to Walker's genus *Sochchora*, which Mr. Meyrick has regarded (Trans. Ent. Soc. 1907, p. 482) as a synonym of *Platyptilia*, Hb., a view in which I am unable to concur, as *Sochchora*, Wlk., appears to me to be quite a distinct genus, more nearly allied to *Oxyptilus* than to *Platyptilia*.

Oxyptilus erythrodactylus, n. s.

♂. Exp. 15·5 mm. Palpi porrect, rather long; second joint longer than the diameter of eye, rather roughly scaled, slightly expanded apically with a few minute spinous hairs; terminal joint about two-thirds length of second, filiform, acuminate, smoothly scaled, fuscous; third joint and centre of second joint darker. Antennae dark fuscous lined with whitish. Head fuscous, a slight ridge of scales between bases of antennae. Thorax fuscous irrorated with blackish. Abdomen fuscous, slightly tinged with reddish-brown, with a slight admixture of whitish scales and considerable admixture of blackish; anal tuft light brown. Fore leg fuscous, irrorated externally with blackish, and narrowly lined on femur and

tibia with white. Mid legs and hind legs wanting. Fore wing cleft to about one-half, segments moderately broad; first segment without posterior angle, apex pointed and slightly falcate; second segment as broad at base as first, slightly expanded posteriorly, tornus well marked, termen oblique and concave, anterior angle produced. Reddish chocolate-brown; a few scattered whitish scales along costa from base to just beyond one-half, a few black scales form an indistinct inwardly oblique subcostal bar bordering base of cleft, discal area narrowly suffused between about one-half and one-fourth with whitish-ochreous, giving the appearance of a narrow paler ill-defined streak running inwards from base of cleft to base of wing; first segment at one-third of its length with an ill-defined but rather conspicuous inwardly oblique whitish-ochreous bar extending across segment from costa to hinder margin, and very indistinctly produced inwards along hinder margin to base of cleft, at two-thirds of its length with an indistinct narrow outwardly curved transverse whitish-ochreous bar, the area between these two bars slightly irrorated with blackish; second segment with an indistinct transverse whitish-ochreous bar before one-half of its length. Cilia and costa chocolate-brown, darker exteriorly, lighter opposite bars; on hinder margin of first segment light fuscous, with a few blackish scales especially evident at about one-half, and a slight black scale-tuft at about five-sixths length of segment; on fore margin of second segment fuscous with a few scattered black scales, at anterior angle blackish, on termen fuscous, rather lighter basally (of cilia); on dorsum fuscous, with a few scattered black scales and slight black scale-teeth at two-thirds, five-sixths, and tornus, cilia between the latter scale-teeth blackish. Hind wing cleft from about one-third and from near base; segments linear; dark chocolate-brown. Cilia fuscous; fore margin of third segment occupied on outer third with short closely-crowded black scales, preceded by a few pale scales, area between these latter and base of segment with a few scattered black scales; dorsum with a minute apical scale-tooth, a small triangular black scale-tooth at about three-fourths, and a few scattered black scales between this and base.

One specimen. TRANSVAAL (A. J. Cholmley), 1906/265. The register states that these specimens are from "Transvaal and British East Africa."

This specimen may possibly be a *Tetraschalis* (I have not been able to examine the neuration), but is apparently undescribed.

Oxyptilus stenodactylus, n. s.

♂. Exp. 20 mm. Antennæ long, porrect, extending length of head beyond it, smoothly scaled, fuscous, dark fuscous beneath; second joint about as long as diameter of eye, slightly enlarged apically; third joint as long as second, cylindrical, blunt at apex. Antennæ finely ciliated, dark fuscous, minutely sprinkled with whitish. Head fuscous, greyish on vertex. Thorax fuscous, sprinkled with blackish posteriorly, greyish on patagia. Abdomen whitish at base, posteriorly reddish brown mixed with whitish, and irrorated with blackish, the black scales forming longitudinal black shades and

streaks, especially laterally; anal tuft short, fuscous. Fore and mid legs broken. Hind leg reddish brown; tibia white on basal third, slightly dilated at two-thirds and apex with scale-tufts, which each emit a pair of moderate whitish black-tipped spurs, of which the inner are the longer, tibia transversely banded with white at one-half and three-fourths; tarsi dark reddish-brown, joints banded basally with white, bands broadest on first and fourth joints. Fore wing cleft to a little beyond one-half, segments narrow; first segment with subfalcate apex and no posterior angle; second segment very slightly dilated posteriorly, tornus almost obsolete, termen oblique. Colour light reddish-brown; a longitudinal greyish discal shade from base of wing to one-fourth, and prolonged less conspicuously into first segment, a minute black subbasal costal dot, a small black discal dot at one-fourth, dorsal area suffused with blackish fuscous from base to one-fourth; first segment with indications (especially evident on costa) of darker inwardly oblique transverse bars before and beyond one-half, the areas following these spaces lighter, and a few scattered blackish scales; second segment slightly suffused with blackish. Cilia on costa dark fuscous mixed with whitish, before and beyond three-fourths narrowly dark brown, followed by narrow patches of ochreous-whitish, black at and before apex; on hinder margin of first segment dark fuscous, blackish subterminally; on fore margin of second segment dark fuscous, with a few scattered black scales, blackish preterminally; on dorsum dark fuscous, cut with narrow streaks of ochreous-fuscous; on termen with a moderate black scale-tooth beneath anterior angle. Hind wing cleft from about one-third and from near base; segments linear; dark fuscous. Cilia dark fuscous; on dorsum with a large broad black scale-tooth at two-thirds, a small black apical scale-tooth, remainder of dorsum thickly strewn with scattered large black scales.

One specimen labelled "MASHONALAND: H. B. Dobbie: 1903/174." The register gives these specimens as from Mashonaland and Beira.

The very narrow segments of the wings, combined with the long palpi, seem to separate this from *Oxyptilus*. It may possibly be a *Tetraschalis*, but wants the apical scale-teeth on segments of hind wing usually characteristic of species of that genus. As I am unable to examine the neuration, I will not erect a new genus for this species, although such will probably be required.

(To be continued.)

NOTES ON ODONATA OBSERVED IN GREAT BRITAIN DURING THE SUMMERS OF 1909 AND 1910.

BY E. R. SPEYER, F.E.S.

AFTER last year's success in dragonfly collecting the expected reaction took place this summer, but not to such a degree as had

been anticipated, and a most important observation, *viz.*, a recurrence of *Somatochlora metallica*, Lind., in Sussex, was successfully made.

1. *Sympetrum striolatum*, Charp. — Immature males were taken near Tunbridge Wells, in Sussex, on August 1st and 5th. Except for two specimens captured later in August at Shenley, Herts, the insect was not observed again until October 15th at Oxford, on which date a male was distinctly seen. Yet another was seen on October 21st, at Shenley, Herts, this being the latest date on which I have, with certainty, met with it.

2. *Sympetrum sanguineum*, Müll. — As was pointed out in my notes of last year (1908), I thought I saw the insect near Tunbridge Wells, and this I have proved to be correct, for I took quite a number of males in that locality and a single immature female on August 5th.

3. *Libellula depressa*, L. — Only four specimens were obtained, all from Shenley, Herts, in July. Three were females, one of which deposited a large number of ova in a tube of water after capture; only one, however, appeared to be fertile, and hatched.

4. *Libellula quadrimaculata*, L. — A single specimen (a male) from Shenley, Herts, is the only record I obtained. It was captured on July 19th. The species was not seen near Tunbridge Wells this season.

5. *Somatochlora metallica*, Van der Lind., as stated above, was again observed near Tunbridge Wells, in the same locality as last year (1908). On August 1st a single male was caught and several others were seen, while on August 5th the species was very plentiful, but I failed to obtain a female. All the specimens were mature, and must have been on the wing some time; a vigorous search for nymph-skins was unavailing. On August 8th a few more males were seen, under somewhat peculiar conditions; the incessant rain had caused an abandonment of entomology for fishing, but about four o'clock in the afternoon the rain ceased, and almost immediately afterwards several males were flying over the water. Rain came on again about half an hour later, and they then disappeared as suddenly as they had come. On August 5th a male was seen to settle repeatedly upon a certain dry twig among the leaves of an elm-tree. When thus settled it was almost invisible, and whenever I observed other specimens settle they always chose long grass, where they were also well protected from view.

The second occurrence of *S. metallica* seems to remove, at any rate, some of the doubt as to the permanent residence of the species. An examination of the intestine of a male showed the presence of numerous fragments of the hard parts of small insects; there was no evidence of large prey having been eaten.

6. *Cordulegaster annulatus*, Latr. was rare near Tunbridge Wells on August 1st; only males were seen.

7. *Æschna mixta*, Latr.—A single male was certainly seen at a weir near Marlow, on the Thames, but could not be captured. After flying erratically for a considerable time, it settled on a reed, and I was able to approach near enough to determine its sex and identity. The observation was made on September 11th.

8. *Æ. cyanea*, Müll.—Four nymphs, which I had kept for more than six months, emerged between July 30th and August 8th. The nymphs had been obtained in Shenley. A female was found near Tunbridge Wells, on August 5th, in a very immature condition, with the nymph-case hanging to some grass beneath it. The latter lacked its head.

9. *Æ. grandis*, L.—Several were seen at Shenley, Herts, on August 11th, and several nymph-cases were found clinging to reeds.

10. *Calopteryx splendens*, Harr., was common at Oxford in June. On May 30th a male was caught with a large mayfly in its jaws, half of which it had eaten.

11. *Lestes sponsa*, Hans., was again very abundant near Tunbridge Wells in August. A female captured on August 8th had the sides of the bronze spot on segment 1 of the abdomen resembling that found in *L. dryas*, but the size of the insect and form of the anal appendages point without doubt to its identity with the commoner species.

12. *Erythromma najas*, Hans.—A single immature male was taken on the Cherwell at Oxford, on May 15th. It was found sparingly at Shenley during June and July.

13. *Platynemis pennipes*, Pall., was common on the Cherwell at Oxford during May and June. It was first observed on May 15th.

14. *Pyrrhosoma nymphula* was common near Tunbridge Wells in August. A female, for the measurement of which I am indebted to Mr. Campion, was only 33 mm. in length, the wing-expanse being 43 mm.

15. *P. tenellum*, L., was not very plentiful near Tunbridge Wells.

16. *Ischnura elegans*, Van der L., was generally abundant at Oxford in May, and at Shenley during June and July; also near Tunbridge Wells.

17. *Agrion pulchellum*, Van der L.—Common on the Cherwell at Oxford in May.

18. *Agrion puella*, L., was found commonly from May to August at Shenley, Herts, on the Cherwell at Oxford, and near Tunbridge Wells.

19. *Enallagma cyathigerum*, Charp., was very plentiful at Shenley in July and August, the blue form of the female being taken on several occasions. The spot on segment 1 of the abdomen of the male showed great tendency to variation in size. The dragonfly was also observed again near Tunbridge Wells in August.

In addition to these, two specimens of *Anax imperator*, Leach, were seen, one at Shenley, Herts, on July 29th, the other (a male) on August 4th, at Framfield, in Sussex.

ODONATA OBSERVED DURING THE SUMMER OF 1910.

Very few Odonata have been observed this season (1910), owing to the small amount of collecting which was carried out.

1. *Libellula depressa*.—Common at Shenley, Herts, on June 26th. A single male was taken at the same locality on July 14th.

2. *Anax imperator*, Leach.—Very common at Shenley on June 26th. The male frequently settled in the grass at the side of ponds. A female was captured ovipositing. Two males were seen on July 14th.

3. *Æschna cyanea*.—A single male on July 14th, at Shenley.

4. *Calopteryx virgo*.—Immature specimens were abundant at Woodstock, near Oxford, on May 28th.

5. *C. splendens*, Harr.—Immature specimens were also abundant in the same locality as the last species.

6. *Erythromma najas*, Hans.—A few were captured at Shenley on July 14th. The insect was common on June 26th.

7. *Pyrrhosoma nymphula*.—A few specimens were obtained, far from water, at Woodstock, on May 28th.

8. *Ischnura elegans*.—Common at Shenley in June and July.

9. *Agrion puella*.—Abundant at Shenley in June and July.

10. *Enallagma cyathigerum*.—Common at Shenley in June and July. A blue female was taken on June 26th.

I was unable to visit the *Somatochlora metallica* locality in Sussex this year, and so I have not been able to make a third observation of the insect.

DESCRIPTIONS OF THREE NEW SPECIES OF ODYNERINÆ FROM JAPAN.

BY P. CAMERON.

Rhynchium brevilineatum, sp. n.

Entirely black, except for a short narrow white line at the eyes opposite the antennæ, and the spurs which are testaceous; the eye incision, face and clypeus, densely covered with longish white pubescence; the ventral surface with shorter pubescence, the back of abdomen with a white silky pile; wings violaceous, the nervures black; the tegulæ black and shining. Clypeus a little longer than wide, the apex with a shallow rounded incision; sparsely, distinctly, but not strongly punctured; the upper part of the head and thorax much more strongly and closely punctured, the post-scutellum coarsely rugosely punctured, its apex obliquely narrowed from the

sides to the middle, which is bluntly rounded. Apex of metanotum smooth, sparsely punctured round the edges, the middle below with a triangular transversely striated band; the sides bluntly rounded, without teeth. Base of metapleuræ smooth above, sparsely punctured below, the rest irregularly longitudinally striated. Propleuræ coarsely punctured above, below irregularly slightly obliquely striated. Mesopleuræ closely, deeply, strongly punctured ♂. Total length 15 mm.

Base of pronotum transverse, narrower than the head. Post-scutellum very slightly raised above the level of the flat scutellum. Sides of metanotum at the base reticulated. Basal segment of abdomen large, cup-shaped, not much larger than the second. Antennal hook, slender, reaching to the base of the eleventh segment.

Allied to *R. argentatum*, *metallicum*, and *maldivense*; it wants the dense white silky pile and the white mark on the top of the clypeus of these species; it is larger and stouter than most of the examples I have seen of them, the post-scutellum is more distinctly, gradually narrowed from the base to the apex, the base of the thorax is more sharply transverse and the puncturation is stronger.

Rhynchium fukaii, sp. n.

Rufo-testaceous, the clypeus, a large mark twice wider than long, transverse above, broadly rounded below on the lower part of the front and a line on the lower part of the eye incision, lemon-yellow; the following parts are black: the face and the part between the antennæ, the front except along the eyes, the lower outer part sharply projecting towards the eyes, roundly narrowed above and enclosing the lower ocellus, the part enclosing the ocelli, except for a curved line outside the ocelli; the occiput, the outer edge of the outer orbits, the inner more narrowly, a broader oblique line, uniting the two at the top of the eyes, the base and apex of mesonotum broadly, more or less of the sides, the metanotum wholly or in part, the greater part of the pleuræ, the mesopleuræ with a large pyriform, rufous spot at the base above, the greater part of the basal two abdominal segments, the line on the second narrowly laterally, the base of the third and fourth and the basal three or four ventral segments, black. Legs coloured like the body, all the coxæ and trochanters, the base of the four anterior femora and the hinder entirely black. Wings rufous hyaline, the apex violaceous. ♂. Length 14 mm.

Clypeus longer than wide, broadly rounded above, the apex with a slight but distinct incision. Front and, to a less extent, the vertex, densely covered with fuscous pubescence. Apex of post-scutellum broadly rounded. Apex of metanotum closely, somewhat strongly obliquely striated, the sides margined above, the middle with a large upper and a smaller lower spine. The apices of the abdominal segments are more strongly punctured than the base, especially the middle ones, which have the apices depressed, with the extreme apex slightly reflexed.

Allied to *R. hæmorrhoidale*; it has the puncturation stronger and closer; the clypeus wider compared with the length, the

head markings are different and there are only two spines on the sides of the metanotum.

Ancistrocerus densepilosellus, sp. n.

Black, the clypeus, labrum, middle of mandibles irregularly, under side of antennal scape, a line on apex of pronotum, one on the apices of the basal four abdominal segments above and on the basal two below, the basal dorsal two narrowed laterally, the line on second ventral widened laterally, the apices of the femora narrowly and the greater part of the tibiae and tarsi, pale yellow; wings hyaline, the stigma fuscous, the nervures darker coloured. Tegulae black. Head and thorax densely covered with moderately long pale pubescence. ♂. Total length 8 mm.

Clypeus as wide as long, transverse above, the apex with a distinct semicircular incision. Antennae thickened towards the apex, the apical two joints brownish beneath, the hook of moderate thickness, reaching to the base of the joint. Base of thorax transverse, with acute projecting angles. Post-scutellum more obliquely sloped than the scutellum. Sides of metanotum bluntly margined. The second abdominal segment is longer than it is wide at the apex; the apices of the segment flat, not strongly punctured.

Ancistrocerus apiciornatus, sp. n.

Black, the apices of the abdominal two basal segments, a short line on the sides of the apex of the second ventral, the clypeus in the male, a line on the base below on the antennal scape in the male and the greater part of the four front tibiae and tarsi, the base of the hind tibiae and the basal joint of the hind tarsi, pale yellow; wings highly iridescent, violaceous on apical half, the stigma and nervures black. Apical joints in male antennae brownish below, thickened, without a hook. Female clypeus a little wider than long, its apex slightly depressed in the centre, shortly, bluntly tuberculate laterally. Clypeus in male a little wider than long, its apex with a rounded, shallow incision. ♀ and ♂. Total length 7 mm.

A slender, narrow species. Shining, densely covered with short white pubescence. Base of thorax transverse, raised. Parapsidal furrows distinct. Scutellum with a wide furrow which does not reach the base or apex; it is widened towards the apex, the apex itself being acutely pointed. Post-scutellum with a curved furrow in the middle, the base more strongly punctured than the apex. Sides of metanotum broadly rounded, closely reticulated. Upper apical two-thirds of propleurae irregularly striated-punctured; meso- and metapleurae smooth, the former more shining than the latter. Basal segment of abdomen strongly punctured, the apical longitudinal furrow long and deep.

The three species described above were sent to me by Mr. T. Fukai, Secretary of the Entomological Society of Japan, of Konosu, Saitama.

NOTES ON THE VARIETIES OF *PERONEA CRISTANA*, FAB., LATELY IN THE COLLECTION OF THE LATE J. A. CLARK; WITH A REVISION OF THE NOMENCLATURE.

BY SYDNEY WEBB.

(Continued from vol. xliii. p. 268.)

CRISTANA, Group A., Addendum.

Nigropunctana, Clark.—Similar to *proxanthovittana*, as now determined, but the central tuft is large and dark brown, instead of fulvous. South (*in litt.*) is of opinion that *nigropunctana*, Clark, and *fulvostriana*, Desv., are referable to the *striana* group, and states that the former only differs from the latter in having a more complete fulvous streak on the inner margin. He regards *fulvostriana* as a form intermediate between *striana*, Haw., and *nigropunctana*, Clark.

DESFONTAINANA GROUP.

Fulvous dash along centre of wing from the base to the fulvous button.

[*Alborivittana*, Steph.—White head and thorax, white vitta.

Fulvocristana, Steph.—Yellow head and thorax, ochreous vitta.

Consimilana, Steph.—Vitta consisting of approximating ashy lines.

Desfontainana, Fab.]

Sericana, Hüb. nec Dup.—Similar to *desfontainana*, but no central tuft; or, if it be present at all, it is extremely small. No vitta.

Ulotana, Clark.—Bluish black. Vitta two striate ashy lines below the deep rusty red central streak, which terminates in the similarly coloured large central tuft. Apparently quite distinct, but in the specimen Clark took for his type the vitta is entirely absent. In his series the two forms are about equally divided in numbers. That with vitta appears to agree with *sericana*, Dup., but the latter name had already been adopted by Hübner for another form; it must therefore be dropped in favour of the later one of Clark's, which will include both modifications of the form, unless we name the striated one *flammeana*.

CRISTALANA GROUP.

Much variegated with light and dark brown, occasionally with white markings, or yellow vitta.

[*Subcristalana*, Curt.]

Sequana, Curt.—Our series of this insect are generally much mixed. Curtis copied his description from a manuscript of Bentley, who wrote thus: "Similar to last [*fulvorittana*, Steph.] but smaller, and having no white in the superior wings, which are purplish brown and variegated. An angulated brown space at the base spotted with black, button large and ochreous at the apex, with a short black streak beyond it, the semiloop on the costa purplish grey, apex lead-coloured, inner margin ochreous; palpi, head, and centre of thorax pale ash colour."

Subfulvorittana, Clark.—Identical with *fulvorittana*, Steph., but the pale lunar crescent on the costa ends abruptly at the central tuft, and is never continued upwards to join the costa beyond it.

[*Cristalana*, Don., and the same form with the addition of a fulvous vitta—*fulvorittana*, Steph.—are both well known.]

Procrystalana, n. ab.—Like *subfulvorittana*, Clark, but without vitta. Button light brown, changing to dirty white on its inner side, where the white fascia from the costa blends into it.

CHANTANA GROUP.

Upper part of wing chestnut-brown.

[*Chantana*, Bent.—Well-defined and equally well known.]

In lots 318 and 319, at Clark's sale, were four specimens of a modification of *chantana* with dark button. These were accepted by Clark as *albostriana*, Haw., which we all know to be one of the forms of *Peronea hastiana*. Having long had the same insect in my cabinet, labelled *postchantana*, we may, I think, call it by that name for want of a better. It differs from *prochantana* by the large black tuft upon the primaries.

Prochantana, Clark, which had been for many years in cabinets mixed with *chantana*, is buttonless and easily distinguishable.

Subchantana, Clark.—May be compared with *subvittana*, Steph., with pale ochreous button. It appears, however, very distinct, and certainly belongs to this group. The fine ashy line along the fold from the basal blotch to the hind margin is not shown in Clark's figure of this form.

Vaughaniana, n. ab.—Light brown with a purplish gloss, the upper part of the wing rufous, a dull red streak from the central tuft to the costa before the apex. Button extremely small, almost wanting, brown; palpi, head, and thorax ash-coloured, an ash-coloured line along the fold to the hind margin, generally consolidated into an ashy grey patch at the extreme base of the inner margin, similar to that of *subchantana*, but not so pale. I dedicate this moth to the memory of my late friend, Howard J. Wright Vaughan, who took a keen interest in the "buttons," and was the first British entomologist to appreciate the im-

portance of collecting local races and the varietal forms connected with them.

VITTANA GROUP.

Upper part of wing chestnut-brown, button dark, vitta orange or composed of striate lines.

[The type *vittana*, Steph., is well known, and no comment upon it is necessary.]

Intermediana, Clark. — The specimen Clark made his type has a somewhat paler vitta than the form *vittana* of Stephens; there are two similar specimens in his series, and three in Bond's, all of which are identical. The remainder of Clark's series are normal *vittana*. This varietal name is therefore of but little value.

Spadiceana, Haw. — A well-known form. From the coloration of its wings it is placed in this group, otherwise the vitta being made up of dull and inconspicuous ashy grey lines, its affinity to the *striana* group in this respect is at once apparent.

Substriana, Steph. — An altogether darker insect, with the chestnut costal portion much obscured. A well-known form. It has no affinity with the *striana* group, in spite of the name.

PROFANANA AND SEMIUSTANA GROUP.

More or less mottled wings, black or very dark brown tuft.

A. No vitta.

[*Profanana*, Fab. — Well known, as is also *semiustana*, Curt.]

B. Vitta orange to palest yellow or white.

[*Provittana*, Desv.]

Flavostriana, n. ab. — In Bond's cabinet are three, in Clark's one, and I have seen others; of lightly mottled specimens easily distinguished from the last. The vitta is distinct and white, tinged along the middle with the faintest yellow. Head and thorax pale cream. I propose for this variety the above name, which was written on the ticket placed by Bond below his specimens.

A form wanting a name is similar to *bentleyana*, Curt., but the head and thorax are white, palpi cream. The large central tuft and vitta pure white. Several specimens have been taken in the New Forest. A very handsome insect.

Another form, somewhat like the last, but the paler blotches upon the wings almost obliterated by the dark ground colour. Head, palpi, and thorax cream, large button, some subsidiary small tufts of raised scales towards the ends of the wings, and vitta cream. Epping Forest and Folkestone. Can this be Duponchel's *combustana*? It may well be, although the mottled

appearance of the wing places it in this group rather than in that of *cristana*.

[*Bentleyana*, Curt.]

Semistriana, Desv. — An extremely rare form akin to *semiustana*, but with distinctly striated grey inner margin.

(To be continued.)

NEW AFRICAN GEOMETRIDÆ.

By LOUIS B. PROUT, F.E.S.

Subfam. ACIDALIINÆ.

Mnesithetis ornithospila, sp. n.

♀, 22 mm. Face and palpus reddish. Fore coxa and femur marked with red above. Thorax above concolorous with wings. Wings pale olive-green, lines darker olive. Fore wing with faint curved antemedian at just before one-third, distinct postmedian at beyond two-thirds, not at all denticulate, sinuate inwards below m^1 ; cell-mark elongate, dark olive; terminal line little darker than ground colour, followed by a pale line at base of fringe; fringe long, concolorous with wing, slightly paler in distal half. Hind wing without the antemedian line, cell-mark white, not broken up into two spots, but forming an angulated mark nearly as in the Hemitheine genus *Ornithospila*. Under side ochreous whitish strongly flushed with flesh-pink; both wings with very faint traces of the postmedian line, otherwise unmarked.

Bitye, Ja River, Cameroons. Type in coll. L. B. Prout.

Differs from typical *Mnesithetis* in having sc^2 of fore wing arising from the cell instead of from the stalk of sc^{3-5} . Will form a new section, if not a new genus.

Acidalia fuscifusa, sp. n.

♀, 26 mm. Face fuscous. Palpus brown, tipped with fuscous. Legs light brown, fore leg fuscous on inner side. Thorax fuscous dorsally. Fore wing light brown; basal half (to median shade) irrorated and irregularly clouded with fuscous, especially towards inner margin; antemedian line obliterated; median shade diffuse, curved (parallel with termen), passing just outside the discal dot; postmedian line dark fuscous, denticulate on the veins, from three-fourths costa, slightly oblique outwards to R^1 , there sharply angled, incurved between R^1 and R^3 ; terminal area fuscous, excepting a patch at costa, the edge of the fuscous shade sloping away from R^1 to just below apex; discal dot small, black; terminal line blackish, interrupted at the vein-ends. Hind wing肘ed at R^3 ; similar to fore wing, the median shade proximal to the cell-spot, postmedian less sharply angled at R^1 . Under side of fore wing similar to upper but less strongly mixed with fuscous; of hind wing free from fuscous admixture only, the lines and cell-spot present.

Bitye, Ja River, Cameroons. Type in coll. L. B. Prout. A second example, from Uganda, in coll. Brit. Mus.

Perhaps related to *Acidalia diffusizona*, Hampson, Proc. Zool. Soc. Lond. 1910, 478 (*Craspedia*).

Subfam. LARENTIINÆ.

Onychia olbia, sp. n.

♀, 30–32 mm. Head and body (with palpus, antenna, &c.) ochreous, more or less mixed with pink, and finely irrorated with darker scales. Palpus long. Antennal ciliation slightly longer than in the typical members of the genus, but lacking the longer bristle at end of each joint. Fore wing with costa slightly more arched than is typical, termen slightly more oblique, rather straight; bright yellow ochre, somewhat mixed with browner scales, and traversed by numerous wavy lines; two in basal patch brown, accompanied by one or two weaker; three in intermediate area, more reddish and very much fainter; three (brown) in the proximal and three in the distal part of the rather broad median band, the proximal three slightly and the next two markedly angled below costa, the sixth (margining the band distally) dentate inwards on sc^5 , bluntly bilobed on either side of M^1 and gently incurved anteriorly and posteriorly to these lobes, accompanied distally throughout by a very fine white line; two in the outer intermediate area reddish, strongly lunulate-dentate, the proximal one much interrupted; median band much clouded with pink, leaving costal, central and inner marginal patches more or less of the ground colour; terminal area darkened, being composed of a blend of ochreous, fuscous and pink scales, a few vague whitish spots on veins indicating the position of the subterminal line; discal spot blackish, elongate, closely following the third median line; terminal line olive-brown, interrupted at the vein-ends; proximal half of fringe concolorous with terminal area, distal half whitish mixed with pink, the halves separated by a thick olive-brown line. Hind wing silky whitish, with a very few brown scales, some slight pinkish marks on inner margin, and a fine, sinuous, brown postmedian line from inner margin at three-fourths, fading out beyond r^2 ; cell-spot weak, small; terminal line as in fore wing; fringe pinkish. Under side of fore wing dirty whitish, irrorated with brown; base, costal and distal margins darker, apical area more broadly so; a brown spot on costa before one-fourth (midway between basal and median bands of upper side); cell-spot strong, elongate, followed by three brown lines, the first two nearly straight, the third darker, angled on r^3 . Under side of hind wing more uniformly mottled with the ochreous, olive-brown and pink scales, palest between postmedian line and terminal area; cell-spot and postmedian line much darker and stronger than above, the latter reaching across wing; fringe concolorous with terminal area.

Near Johannesburg (Edmund A. Bacot). Type and a precisely similar but somewhat worn female in coll. L. B. Prout, kindly presented by Mr. A. Bacot.

Probably nearest to *Onychia arenaria*, Warr., Nov. Zool. ix.

518 (*Plerocymia*). The generic name *Plerocymia*, Hüb., is purely a synonym of *Larentia*, Tr.; its type (*clavaria*, Haw., = *cervinata*, Schiff., nec *cerrinalis*, Scop.) has biangulate *dc* in the hind wing, which is not the case with the present genus.

Onychia (?) *lamprammodes*, sp. n.

♀, 30 mm. Head, body and tip of palpus whitish, irrorated with sandy and fuscous; palpus otherwise sandy, irrorated with fuscous; abdomen beneath strongly mixed with sandy; thorax in front with a narrow fuscous bar. Fore wing narrow, costa nearly straight, slightly convex basally and distally, faintly concave between; whitish ochreous, almost entirely covered by bright sandy ochreous markings, costal edge slightly darker to *sc* (excepting apical end); markings consisting of about twelve, mostly ill-defined lines, running obliquely from inner margin; the first four (proximal to the discal dot) acutely angled in cell, the fourth (indicating the commencement of a slightly darkened, more reddish ochreous median band) marked with fuscous at inner margin and on *M* at origin of *M*²; the next four nearly straight, the eighth conspicuous, forming the distal boundary of the central fascia, and followed by a fine pale line; the next two also nearly straight, in a pale band which runs to costa at apex, last two virtually coalesced into a narrow band; cell-spot minute, black; terminal line fuscous, broken up into spots; fringe concolorous with termen. Hind wing narrow, costa long, apex rounded, prominent, termen slightly sinuous, scarcely convex; nearly concolorous with fore wing, slightly less bright, base and a postmedian band whitish, the intermediate area blurred, with a confused suggestion of four transverse lines; a diffuse, sandy ochreous subterminal band; cell-spot, terminal line and fringe nearly as in fore wing. Under side blurred sand-colour, finely (the hind wing more coarsely) irrorated with darker; both wings with ill-defined pale postmedian band and small dark cell-spot.

Near Johannesburg (Edmund A. Bacot). Type in coll. L. B. Prout, presented by Mr. A. Bacot.

Affinities somewhat doubtful, perhaps nearest to "*Plerocymia*" *albiclaua*, Warr., Nov. Zool. iv. 236. The shape and pose of markings superficially recall a narrow-winged specimen of *Horisme* (e. g. *minuata*, Walk., or especially *aquata*, Hüb.), but the abdomen is not crested; *dc*³ of the hind wing is extremely oblique, and *c* anastomoses to very nearly the end of the cell.

Subfam. GEOMETRINÆ.

Ectopis (?) *amphitromera*, sp. n.

♀, 36 mm. Head and body brown mixed with fuscous, abdomen with paired black dorsal spots. Palpus quite moderate, stout. Fore and middle legs mostly fuscous, pale at ends of joints (hind legs lost). Fore wing moderately broad, apex blunt, termen faintly waved; ochreous brown coarsely irrorated with fuscous; markings dark fuscous; antemedian line obscure, placed and bent as in *delosaria*,

Walk.; an obscure, slightly curved median shade crossing the cell-spot, which is rather large and oval, but not pale-centred; postmedian line from two-thirds costa, nearly parallel with termen, slightly incurved between m^1 and sm^2 , lunulate-dentate, the teeth pointing distad and thickened; subterminal line pale, ill-defined, interruptedly lunulate, the lunules filled in proximally with fuscous, those on either side of m^1 the largest and whitish; terminal lines consisting of a series of black crescentic dashes, well separated by the veins. Hind wing with the median shade becoming antemedian, passing well proximally to the cell-spot, which is somewhat smaller than in fore wing; postmedian, subterminal and terminal lines as in fore wing. Under side similarly coloured, the fuscous irroration somewhat more irregular, denser in the entire distal area. Fore wing with antemedian line obsolete, median shade weak, cell-spot as above, postmedian thick, diffuse, accompanied distally by an ill-defined pale shade, which thickens on inner margin; subterminal line almost obliterated, excepting a rather large pale spot anterior to, and a small one posterior to m^1 . Hind wing similar, the pale dentate postmedian shade somewhat better defined.

Near Baringa, Lulongo River, Congo, long. 21° E. (Rev. E. Cartwright). Type in coll. L. B. Prout, kindly presented by Mr. G. R. Baldock.

Upper side somewhat as in *Ectropis delosaria*, Walk. (= *crassa*, Warr.), colour brighter brown, discal spots not ocellated, build somewhat more robust; under side quite different from that species. Venation agreeing— sc^{1-2} of fore wing long-stalked, arising from cell and not separating till well distad to the separation of sc^5 from sc^{3-4} .

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 272.)

Boarmia griseoviridata, sp. n.

♂. Fore wings greenish grey, finely powdered with blackish; antemedial line blackish, slender, indistinct; postmedial line blackish, dotted with black on the veins, outwardly edged with paler; between postmedial line and the black discal spot is an irregular line, black and serrate towards the costa, sinuous and blackish below the cell where it approaches the postmedial; subterminal line pale, sinuous, marked with black at apex, between veins four and six and above dorsum; termen with black dots more or less connected by a slender black line; fringes brownish. Hind wings agree in colour with fore wings; discal spot and postmedial line black, the latter indicated by dots on the veins, otherwise indistinct; subterminal line pale, inwardly edged with blackish; termen crenulate, dotted with black between the veins; fringes brownish. Under side pale brownish,

all the wings have a black discal dot, and traces of a postmedial line.

♀. Similar to the male, but the subterminal line of all the wings broadly bordered with purplish brown; the dorsum of fore wings is also purplish brown from the subterminal line to the base of the wing.

Expanse, ♂ 50–52 millim., ♀ 48 millim.

Collection number, 1544.

Two male specimens and one female from Kanshirei (1000 ft.), 1908. One of the males is paler in colour than that described, and the transverse lines are less distinct; it was taken in March, the type male in July, and the female in May.

Alcis subpunctata, sp. n.

♂. Fore wings greyish white, powdered with brownish and sparingly sprinkled with black scales; antemedial line black, slender, dotted with black on the costa and the median nervure; postmedial line black, finely toothed below costa, and indented above dorsum; discal mark lunulate, the lower cusp touching the postmedial line, and the upper cusp connected by dark scales with a black spot on the costa: a series of elongate black spots on termen. Hind wings slightly paler, with blackish discal spot; postmedial line blackish, curved and recurved, terminating in a black spot on dorsum, irregularly toothed on the veins; termen marked as on fore wings; traces of a white subterminal line towards tornus. Under side as above but paler, and the markings generally less distinct; discal spot on hind wings more conspicuous.

Expanse, 34 millim.

Collection number, 802A.

A male specimen in rather poor condition from Rantaizan (7500 ft.), May 9th, 1909.

Alcis nigronotaria, sp. n.

♂. Pale greyish brown, with a black, rather large, discal spot on each wing; ante- and postmedial lines of fore wings black; the former indented below costa, thence inwardly oblique to dorsum; the latter irregularly toothed, almost parallel with termen; space between the lines slightly paler. Postmedial line of hind wings black, slightly curved outwards beyond the discal spot, and inwards below the discal spot; the basal area somewhat paler. Under side similar to upper but paler, lines less distinct.

Expanse, 33 millim.

Collection number, 802.

A male specimen from Tainan, April 20th, 1906.

Alcis fulvipicta, sp. n.

Basal and outer areas of the fore wings brownish, mottled and clouded with darker; medial area whitish, mottled with greyish brown, and with a band-like tawny cloud along its outer limit; ante- and postmedial lines indistinct, the former obscured by the clouding

on basal area, and the latter represented by blackish marks; subterminal line whitish, serrate, inwardly edged with blackish; a blackish spot at end of the cell, its inner edge black; three black bars on outer area towards costa, and two similar bars near dorsum, are interrupted by the whitish subterminal line. Hind wings whitish, mottled with brownish except on costal area; discal dot blackish; postmedial line indicated by dusky dots; a blackish dot at tornus and one beyond it on dorsum. Under side whitish, the dark markings somewhat as above on the fore wings, but discal dot and postmedial line of hind wings more distinct than on the upper side.

Expanse, 37 mm.

Collection number, 805.

A male specimen from Rantaizan (7500 ft.), May 11th, 1909, and a female from Arizan (7500 ft.), September 11th, 1906.

Allied to *A. eurydiscaria*, Hampson.

Episopthalma taiwana, sp. n.

♂. Green, with an ochreous ringed blackish spot on each wing; antemedial line of fore wings rather darker, inwardly edged with paler, crenulate; postmedial line darker, outwardly edged with paler, almost whitish, serrate; traces of a pale crenulate subterminal line. On the hind wings there is a serrate, curved line beyond the discal spot, this is blackish towards costa; the costal area tinged with pinkish brown from line to base of the wing. Fringes pinkish brown, preceded by darker crenulate line. Under side leaden grey, all wings with dusky postmedial line; costa of fore wings ochreous.

♀. Similar to the male, but the edges of transverse lines whiter. Expanse, ♂ 46 millim., ♀ 48 millim.

Collection number, 1547A.

One example of each sex from Kanshirei (1000 ft.); the male captured May 2nd, and the female July 10th, 1908.

This species is very like *Chlorodontopera chalybeata*, Moore, but the antennæ are almost simple in both sexes; the margins of the wings are less crenulate, especially those of the fore wings.

BY THE WAY.

SINCE Spence wrote Letter xxv. of the 'Introduction to Entomology,' we can recall no claim made to *ignes fatui* as an entomological subject. He distinctly states, however, his expectation that luminous insects would be discovered to be the explanation of the phenomenon, and regards the phosphureted hydrogen theory as impracticable on account of the light's erratic and local movements in a high, steady breeze. Personally, we have (with Wailes) vaguely supposed it to be "the spontaneous ignition of gaseous particles" given off by decaying

vegetable matter. But the only person who has ever “knocked down” a will-o’-the-wisp—at Ickleton, Cambs, in 1780—found *Gryllotalpa*! A recent writer in ‘Country Life’ brings forward a very different explanation, pointing out that Linné probably named the barn-owl *Strix flammea* on account of the occasional luminosity of its breast-feathers, caused (thinks Lydekker) by “their plumage having come into contact with phosphorescent bacteria developed in the decaying wood of their nesting resorts.” But jack-o’-lanterns are not found in farmyards, and even a Cambridge yokel of 1780 knew a barn-owl from a mole-cricket!

Commercial Science rises to great heights with the United States. We have received a ‘Price List of Philippine Insects in the Collection of the Bureau of Science, Manila, P. I.,’ which we suppose to be an official emanation, since no dealer’s name is blazoned forth. The prices are very definite, and nicely printed on creamy paper, and one is given the family name of each species free. They seem to possess many insects, but only one stands under Ichneumonidæ; this is “*Megischus tarsatus*,” and will cost you a dollar, but *Megischus*, Brullé (1846), is a mere synonym of *Stephanus*, Jur. (1807), the typical genus of the Stephanidæ, and not an ichneumon at all—*bursa non caput*! At the same time came ‘Insects and Disease,’ by R. W. Doane, A.B., Assistant Professor of Entomology, Leland Stanford, Junior, University; it is described as a popular account with original illustrations. The text seems, like Hamlet, “made up of quotations.” The Thirty-fourth Annual Report of the Lancashire and Cheshire Entomological Society shows it a thriving institution with a good balance behind it.

The views of Professor Perrier, of astronomical fame, respecting the entomology of Mars read like the more extravagant of Miss Budgen’s ‘Episodes of Insect Life.’ Owing to the lesser gravity, jumping animals would predominate; the great extremes of seasonal temperature would produce “quick-living” creatures, which complete their active life in a single season, such as butterflies. Flowering plants would grow in abundance, and the six-hundred-and-sixty-eight-day-year points to “intense growth and reproduction, immensely tall grasses, huge fruit, and gigantic insects. As life is a greater struggle there, the writer is led to assume a high plane of intelligence in Martian insect-life. He imagines the wisdom of a thousand ants resident in the brain of one great Martian blackbeetle.” With us a sufficient number of such *Blattæ* in England would probably place the “Back to the Land” theory within practicable politics, for (as

few town-dwellers realize) there are no cockroaches in the country.

Survey parties, consisting in the entomological section of officials from both Edinburgh and Dublin Museums, as well as private collectors, have again been investigating the fauna and flora of Clare Island and the adjacent mainland of Co. Mayo this season. The weather has been unusually anticyclonic for that district, and the bays very full. The Survey will end with the present season, and Mr. R. Ll. Praeger, of the Dublin Library, will be glad of English assistance on Clare during the autumn.

C. M.

NOTES AND OBSERVATIONS.

STERRHA SACRARIA IN SCOTLAND.—I have pleasure in recording the capture of a female specimen of *Sterrha sacraria* on August 18th. My boy saw the moth flying in the afternoon over a patch of grass near my house. Being without a net, he caught it with his hand, consequently the specimen was not in cabinet condition.—L. G. ESSON; 376, George Street, Aberdeen.

LIMENITIS SIBYLLA (LEPIDOPTERA) IN SURBITON.—Dr. R. N. Goodman tells me that he found a "White Admiral" on a gravel walk on Surbiton Hill, on July 8th last. Of course this may only be an escape, but it seems well to record the occurrence, as the species has been found in several places in Surrey of late years.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE IN SOUTH WALES.—A specimen of *Colias hyale* was taken on the sandhills near Porthcawl, one day last week, by Mr. David Nicholl, of Laleston House, Bridgend.—(Mrs.) M. D. B. NICHOLL; The Cottage, Merthyr Mawr, Bridgend, August 21st, 1911.

COLIAS HYALE (LEPIDOPTERA) IN THE ISLE OF WIGHT.—Mr. E. A. C. Stowell tells me that he took five examples of this butterfly out of one clover-field at Freshwater, August 12–13th last. Since then he saw no others there, or elsewhere, in the island.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE IN BUCKS.—On the 14th inst., while crossing a grass field near Bourne End, Bucks, I saw a specimen of *Colias hyale* settle on a solitary flower-head of clover. Unfortunately I had not my net with me, but after a little careful "stalking," I managed to secure it under my hat! It is a perfect male.—E. S. A. BAYNES; 120, Warwick Street, S.W., August 16th, 1911.

COLIAS HYALE NEAR NORWICH.—On August 7th I had the good fortune to capture a specimen of *Colias hyale* at Hellesdon, near

this city. It was taken flying over a patch of lucerne, and is a fine male in perfect condition.—ROBT. LADDIMAN; 25, Drayton Road, Norwich, August 23rd, 1911.

COLIAS EDUSA AND C. HYALE IN SUSSEX AND OXFORDSHIRE.—Commander J. J. Walker informs me (August 23rd) that his nephew, Mr. H. G. Champion, has been taking both species at Shoreham, Sussex. Also that he saw a fine male *C. hyale* at Weston-on-the-Green, near Summertown, Oxford, on August 16th. — RICHARD SOUTH.

SPHINX CONVULVULI AT DULWICH.—I have just taken a fresh specimen of *Sphinx convolvuli* in our front garden here.—GEO. S. ROBERTSON; St. Anne's, 101, Thurlow Park Road, Dulwich, S.E., August 24th, 1911.

SPHINX CONVULVULI IN KENT.—I should like to record the capture of a fine female *Sphinx convolvuli* at rest on a fence in this district, on August 15th, 1911.—ETHEL M. MORGAN; 24, Queen's Road, Tunbridge Wells, August 15th, 1911.

SPHINX CONVULVULI IN CAMBERWELL.—A very fine female specimen of *Sphinx convolvuli* was brought to me this morning, taken by Mrs. Jagers, 5, Mosedale Street, Datchler Place, Church Street, Camberwell, in the early morning at rest on a jacket that had been left hanging on a line to dry all night.—C. HUDSON; 263, Camberwell Road, London, S.E., August 25th, 1911.

NONAGRIA SPARGANII IN SUSSEX.—I should like to record the capture of *N. sparganii* near Seaford, Sussex. Working with Mr. P. C. Reid and Mr. W. E. Nicholson on the 24th ult., between us we took seven pupæ of this species, and so far I have bred three imagines.—FRANCIS C. WOODBRIDGE; The Briars, Gerrards Cross, Bucks, August 2nd, 1911.

CAPTURE OF CHRYSOPHANUS PHLÆAS VAR. SCHMIDTII.—My daughter, Miss Gwendoline Nurse, captured a specimen of the above in fair condition on August 11th, at Dolgoch, Towyn, Merioneth. It is similar to the one figured on Plate 101, No. 7, in South's 'Butterflies of the British Isles.'—(Rev.) E. J. NURSE; The Rectory, Windermere.

ARGYNNIS LATHONIA IN GUERNSEY.—I should like to record the capture, on August 7th, in Guernsey, of a perfect female specimen of *Argynnis lathonia*. The capture was made about noon in a lucerne field bordering on the sea.—H. G. LEKAY; 11, Wontner Road, Upper Tooting Park, London, S.W.

CATEREMNA TEREBRELLA IN EAST DEVON.—It may be of interest to record that my colleague, the Rev. J. S. Martin, bred in July a specimen of *C. terebrella* from a spruce cone collected with others near Ottery St. Mary, Devon. This seems a far cry from the home of the species in Norfolk. I have for several years collected the cones from the same spot in order to breed *strobilella*, but have unfortunately thrown them away as soon as the Tortrix emerged.—JOHN W. METCALFE; Ottery St. Mary, July 31st, 1911.

DATES OF EMERGENCES OF CERTAIN BUTTERFLIES IN 1911.—It may be of interest to record the dates of emergences of some of the butterflies in this neighbourhood during the present abnormally hot summer:—*Lycæna minima*, most abundant but very worn, June 15th. *Epinephele tithonus* (males only), very plentiful, July 5th. *Adopæa lincolna* (males principally), most abundant, July 7th; this species had apparently been out quite a week. *Cyaniris argiolus*, second brood, a large and fine form quite plentiful in my garden, July 8th. The larvæ were not uncommon up to the end of June, feeding on young holly leaves.—A. H. JONES; Shrublands, Eltham, August 19th, 1911.

NOTE ON AMPHIDASYS BETULARIA, TEPHROSIA BIUNDULARIA, AND TRICHIURA CRATÆGI.—I have reared over forty specimens of *Amphidasys betularia* this season from ova deposited by a female intermediate between the type and ab. *doubledayaria*. I find that the percentage of males and females is exactly equal. Is this not rather unusual? Also on May 16th, 1910, I went to "Pamber Forest," Hants, and among the insects I took was a female of *Tephrosia biundularia* closely approaching if not quite identical with ab. *delamerensis* as shown in 'Moths of the British Isles,' Plate 136, Fig. 8. I kept it alive for ova, of which it laid about thirty, and from these moths were duly reared. The pupæ were kept out of doors all the winter. The moths, twenty-two in all, emerged between April 19th and May 13th, 1911. Eleven (seven males, four females) are like Fig. 6, Plate 136, while the other eleven (eight males, three females) very closely approach Fig. 8, Plate 136. On September 19th, 1910, I took a specimen of *Trichiura cratægi* on a lamp at Reading in grand condition. I think this species is rather scarce in this locality?—H. L. DOLTON; 27, Brunswick Street, Reading, July 10th, 1911.

HYBERNATION OF PYRAMEIS ATALANTA.—In reply to Mr. Frohawk (p. 248), I really have no "views" on this question, and should be sorry to dogmatise on the little knowledge I possess of the habits of *P. atalanta*. Before, however, accepting as proved the theory that *atalanta* in Britain is due entirely to immigration, we need considerably more proof than either Mr. Newman or Mr. Frohawk has given us. Like other species, this may hibernate, either as (1) imagines: Mr. Newman's experiments in artificial heat hardly disprove the possibility; (2) ova: some of the late summer ones may not hatch till spring; (3) larvæ: the full-grown ones mentioned by Mr. Frohawk in October may—some of them—outlive the winter in that state; or they may as (4) pupæ tide through the winter. I would point out that purely negative proof is not sufficient; suppose, for instance, that only one out of a thousand *atalanta* hibernated in one of its forms, it would still be quite as adequate to account for its distribution as a few specimens blown over from France. Supposing the above four possibilities disposed of, there still remains the difficulty, which Mr. Frohawk has not attempted to explain, that North French conditions are no more favourable to hibernation than English ones, and that, therefore, if hibernation in England is ruled out, so it must

be with North France. Personally, it seems to me much more probable that hibernated imagines from Cornwall should renew the *atalanta* population of England than that they should come all the way from the warmer parts of Europe; but, as already pointed out, neither hypothesis is necessary, unless the possible hibernation in states other than the imago is disproved. There is one other form of evidence possible. Has *atalanta* been seen or recorded in mid-Channel at all frequently? I have seen on the Riviera, on two consecutive days, huge flights of *cardui* come up from the sea—so many, indeed, that they passed for perhaps a quarter of an hour; but I do not know whether anything of the kind has been observed with *atalanta*.—J. C. WARBURG.

SECOND BROOD OF CERURA FURCULA.—On June 22nd I found four small larvæ of this species, of which two duly pupated. I put the pupæ in a cage with others due to emerge next year. On July 29th I casually looked at the cage, when I found that the imago had emerged from each of the above-mentioned pupæ. One had evidently been out several days, as it had knocked itself about, so that it had become useless as a specimen; the other was in better condition. I see that Barrett gives one instance of this species having a second emergence in this country. In the present abnormally hot summer it seems probable that several species, ordinarily single-brooded, may produce a second brood, and I think lepidopterists should place on record instances which come to their notice.—C. G. NURSE (Lt.-Col.); Timworth Hall, Bury St. Edmunds, July 30th, 1911.

NOTE ON AGRION ARMATUM, Charp.—Perhaps a note supplementary to Mr. W. J. Lucas's remarks on *Agrion armatum* in the current number of the 'Entomologist' may not be out of place. When Mr. Lucas writes, "The specimen was of as bright a blue as that of *Agrion puella*," &c., it must not of course be understood that the entire body was blue. The pale marks, as shown in the plate, on the frontal and posterior segment only were of the bright blue colour, and the same remark applies to the brilliant green of the prevailing form in the Broads. From my experience the blue-marked form is rare in the Norfolk Broads, for I only captured one, and I do not think I saw another among the large number I saw on May 28th last year, nor among the fewer specimens seen on the several previous days. On the other hand, descriptions of the species seem to denote the blue-marked as the prevailing form on the Continent. I don't know from where Mr. Lucas got the notion that I took "about a dozen on May 28th," for on that day I took a considerably larger number than that, but not nearly so many as I saw!—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, August 5th, 1911.

GEOGRAPHICAL DISTRIBUTION OF MACARIA LITURATA var. NIGROFULVATA.—As the season has come round again for larvæ of *M. liturata*, it would be interesting if collectors could add to the localities for this interesting and well-defined variety, as well as publish their results in the 'Entomologist' when the moths emerge next June. September is perhaps the best month for the larvæ, but many are to be had in the first half of October. I have never beaten the caterpillar

from larch, as the branches are out of reach, but they readily fall into the beating-tray, or inverted umbrella, when the lower branches of Scotch fir are tapped. The caterpillar is green, striped with white-yellow, and can readily be distinguished by its reddish head. There is also a grey form with purplish, black-brown head. At present the variety *nigrofulvata* would seem to have been observed only in Shropshire, Cheshire, and North Lancashire.—J. ARKLE; 25, King Street, Chester.

THE SCENTS OF BUTTERFLIES.—A discourse upon this very interesting subject was delivered by Dr. Dixey, at the Royal Institution, on March 3rd last. It is fully reported in 'Nature' for August 3rd, pp. 164–168.

PUBLIC EXHIBITION OF BUTTERFLIES.—The collection of butterflies, from all parts of the world (about 18,000 specimens), formed by Mr. Walter Dannatt, F.Z.S., will be open to the public during three weeks, dating from August 28th, at 400, Oxford Street.

REFERRING to Mr. Claude Morley's note under the heading "By the Way" in the August number of the 'Entomologist,' I think the Germans have improved on the notice prohibiting sugaring on the trees in the New Forest, as in the little valley at the head of the Konigser they have put up a board to the effect that anyone convicted of catching *Parnassius apollo* or taking away its larvæ is liable to a fine of 150 marks or three months' imprisonment.—H. H. S.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 8th.*—Dr. T. A. Chapman, F.Z.S., in the chair.—Mr. H. W. Andrews exhibited many species of the dipterous family Syrphidæ, most of them being from Kent.—Capt. P. A. Cardew, an example of *Anarta cordigera* from Rannoch, in which the hind margin and base of the fore wings were of an unusually pale grey.—Mr. S. Blenkarn, more than one hundred and fifty species of Coleoptera taken in the Isle of Wight from April 23rd to May 10th, mostly Geodephaga. Among them were *Tachyusa umbratica* and *Galerucella calvariensis*, new to the district.—Mr. Gadge, a box of Lepidoptera set so that the pin did not show through the thorax.—Mr. Edwards, a box of the species comprising the genus *Charaxes*, and a larva of *Diloba ceruleocephala* feeding on laurel.—Dr. Chapman, living larvæ of *Callophrys avis* from the South of France.

July 15th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Percy Harris, of Streatham Hill, was elected a member.—Mr. Tonge, ova of *Manduca atropos*, dissected from a captured female by the Rev. C. R. N. Burrows. They were infertile, but an ovum laid previously had produced a larva which he now exhibited in the third instar.—Mr. Hy. J. Turner showed some remarkably light-coloured pupæ of *Vanessa io* from Clandon.—Mr. R. Adkin, a series of *Biston*

hirtaria that had remained for three winters in pupæ, and contributed notes.—Mr. West (Ashtead), a series of *Dianthæcia capsincola* bred from *Silene* in his own garden, and a captured headless moth of *Xylophasia hepatica*.—Mr. Blenkarn, a selection of *Abraxas grossulariata* bred from about two thousand five hundred Gateshead larvæ. Two nice asymmetrical forms were perhaps the most striking of a scarcely more than ordinary series.—Mr. Jäger, a series of twelve *Callimorpha hera* bred on June 22nd of this year, quite a month earlier than he had ever bred the species before.—Mr. W. J. Kaye, a fine aberration of *Mimas tiliæ*, with the usual transverse fascia of the fore wings reduced to a very small elongated central spot.—HY. J. TURNER, *Hon. Rep. Secretary*.

RECENT LITERATURE.

St. Albans and its Neighbourhood; an Account of the Topography, Geology, Hydrology, Climate, Flora, Fauna, and Archaeology of the District, with a Guide to the Hertfordshire County Museum. By Members of the Hertfordshire Natural History Society.* Edited by JOHN HOPKINSON, F.L.S., F.G.S., F.Z.S., &c. Illustrated by Views, a Plan of the City, and a Map of the Vicinity. London: Dulau & Co. Hertford: Stephen Austin & Sons. 1911.

As indicated by the title, the scope of this volume of forty-five pages is somewhat comprehensive; in consequence of limited space, treatment of the various subjects is necessarily restricted; much valuable information is given nevertheless.

In the section dealing with Insecta, Mr. A. E. Gibbs reviews the present knowledge of insects of all Orders in the St. Albans area. So far it appears that the Coleoptera have received but little attention, and the same remark holds good as regards Hemiptera, Orthoptera, and in part Hymenoptera and Neuroptera.

Of Odonata, nineteen of the twenty-four species recorded for the county have been found in the St. Albans district, which is also credited with ten species of Trichoptera.

All but some two hundred and fifty of the eleven hundred and eighty-two species of Lepidoptera recorded for Hertfordshire occur in or around St. Albans. Rather more than half of the total number of species mentioned belong to those families of moths which are neglected, unfortunately, by the majority of lepidopterists.

In Diptera one hundred and sixteen species "occur within the five-mile radius."

OBITUARY.—We have to announce, with sincere regret, that Mr. ALBERT HARRISON, of Delamere, Grove Road, S. Woodford, passed away suddenly on August 28th last.

* 'Transactions of the Hertfordshire Natural History Society and Field Club,' vol. xiv. part 3, June, 1911.

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A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(i) *In Charente. Angoulême.*

I USE the word "unexplored" for the title of these short faunistic papers in a purely entomological sense, and meaning thereby a part of the country wholly outside the cognizance of our British, and in some cases also of French, lepidopterists.

Gradually I am collecting information both first-hand and through the kindness of many correspondents on the other side of the Channel, which may throw some light on the curious problems of butterfly distribution in France, more especially as it indicates the trend of immigration to our shores; the reasons why certain species have stopped short at the narrow dividing sea; and why others, after apparently establishing themselves here (or even indigenous species), have gradually disappeared, not only from their authentic haunts in Britain, but also in Brittany, Normandy, and the Nord generally. Unfortunately the limits of a summer holiday confine the scope of enquiry within extremely narrow compass, but this year (1911), at all events, I have managed to make a "pioneer" expedition, which may lead me and, I trust, others of my entomologically inclined friends to visit the western regions of France for systematic study of its notably rich lepidopterous fauna in those favoured spots where *petite culture* has not entirely banished the butterfly from the face of the land.

A glance at the map of 'France Géologique' (par E. Levasseur) affords a useful indication for the lepidopterist who by experience has learnt that the calcareous strata therein depicted offer the most fruitful field for exploration. Between the volcanic rocks of Auvergne and the schist formation of Limousin and the Gulf of Gascony there is a large cretaceous tract, and in the neighbourhood of Angoulême there is no mistaking the agreeable fauna and flora which accompany the normal

chalk-down. Probably I should have never discovered the little *El Dorado* for butterflies I am going to describe had I not read the delightful preface to M. Oberthür's '*Lépidoptérologie Comparée*,' fasc. iii., in which he draws a sunny picture of the country to the south-east of the former royal city, towards which we set our faces on the morning of June 30th—that is to say, Mr. B. C. S. Warren and I. That we had initial difficulties in discovering the way goes without saying. No one among the hotel servants appeared to have heard of Puymoyen, though that village is but a few kilometres beyond Angoulême, while the only information I could gather as to the forest of Livernant was that such a wood undoubtedly existed in the Gironde, miles away, that being the native Department of the "boots," who volunteered the information. At last, however, we got a map on which Puymoyen was marked, but not one of the otherwise excellent *cartes géographiques* made mention of the forest, and I came to the conclusion that the "boots" was right, and that my memory of M. Oberthür's description was at fault. At all events, we never reached that particular locality, though from after-information it is a fact that we were within a mile of it in the Vallée des Eaux Claires; consequently we missed what is probably the best woodland hunting-ground in South-west France, where of normal years a magnificent form of *Melitæa athalia* disports itself, and *Cænonympha ædipus*—that illusive butterfly of the south-western marshes—is common enough.

However, we did manage to have an excellent day's collecting, and as soon as we had left Angoulême well behind us, and crossed to the long hill gradient on the opposite side to the Riberaç road, guided by the none too frequent finger-posts, the sport began. This road at first slopes sharply upward, with occasional chalk-pits, detached patches of bramble, and clumps of marjoram. Hovering over the latter were many fine examples of *Lycæna arion* in all the bloom of their first beauty, with a few rather worn *Anthocera hippocrepidis*. Over the common land by the roadside *Cupido minimus* was very abundant—we had seen it actually in the hotel garden at Poitiers the day before—while *Agriades thetis* (*bellargus*), much to our disappointment, was in the last stage of a decadent first brood. We had, indeed, broken our journey to the south on its behalf, for Angoulême is recorded as a habitat of the lovely female aberration, *cælestis*, Obthr., and it looked very much as though we were destined to have arrived too late on the ground. Other "blues" to the fore were *Polyommatus icarus*, magnificent males of *Rusticus argus*, L. (*ægon*), while in the dwarf oak scrub which fringed the road *Strymon spinî* was flying in quantities and in the finest condition, but varying only in size—a curious little dwarf male I boxed measuring no more than the typical *C. minimus*. *S. ilicis* occurred also singly, while the brown "skippers," *Adopæa*

lineola and *Augiades sylvanus*, were well to the fore. At this early date the apparition of *Satyrus circe* and *S. hermione*—the former in the ascendant—was something of a surprise; nor can I find from my field-notes that in all our subsequent wanderings we encountered this magnificent Satyrid again. But by this time it was noon, and still we had not arrived at the village of Puymoyen, from which we presently passed to the chalk hills sloping gently towards the lovely valley, well designated Eaux Claires, for it was there at the coldest of streams, bubbling out from a fern-wreathed “source,” that we quenched our thirst and took our *déjeuner*. Hard by we had feasted our eyes on the last of the spring *Gonepteryx cleopatra*, and boxed a few richly coloured females of *Melitæa didyma*; occasional *Everes (argiades) amyntas* further kept our nets busy, and here also, though we took several of the desired *cælestis*, they were in such forlorn condition that we gladly gave them their liberty. I may say too that, although we were of course too early for it, *Lycæna euphemus* is a speciality of this valley, while, had we but known it, on the other side, across the scented hay-fields where the peasants were carting their first rich crops, but a low line of hills divided us from the much-discussed forest of Livernant. We devoted the rest of the afternoon, however, to questing for *cælestis* unsuccessfully on the chalk-downs on the Puymoyen side, finding a pretty light form of *Pararge egeria* in the little brook-side copses, and the long green grasses hung with *Thymelicus actæon*. Hereabout also I captured a perfect *Pieris manni*, chiefly interesting to me as the first from Western France which had fallen to my share. It is, however, common enough in these regions, and up to the north as far as Angers, where M. Delahaye reports and describes it in an interesting monograph on the variation of the species in his Department, Maine-et-Loire.*

For a single day's experience the following list of species observed and taken is decidedly encouraging. I have also included, in brackets, the one or two further species met with by M. Charles Oberthür, and M. Dupuy, of Angoulême, at this particular spot:—

Adopæa lineola, *Augiades sylvanus*, *Thymelicus actæon*; *Hesperia carthami* (one very worn example); *Callophrys rubi* (one); *Strymon spini*, *S. ilicis*;† *Everes argiades (amyntas)*; *Cupido minimus*; *Rusticus argus*, L. (= *ægon*, Schiff.); *Agriades thetis* (and ab. ♀ *cælestis*), [*A. corydon* ab. *syngrapha*]; *Polyommatus icarus*; *Lycæna arion*, [*L. euphemus*]; *Aporia cratægi*, *Pieris manni*; *Colias edusa*, *C. hyale*; *Gonepteryx cleopatra*, *Argynnis aglaia*; *Brenthis dia*, *B. euphrosyne* (one); *Melitæa*

* ‘La Pieris Manni en Maine-et-Loire. Principaux Caractères de la Race angevine.’ D. Delahaye. Angers, J. Siraudeau. Dec. 1910.

† M. Dupuy informs me (*in litt.*) that *Chrysophanus alciphron* var. *gordius* comes as far north on this side of France as Angoulême.

didyma, [*M. athalia*]; *Pyrameis cardui*, *P. atalanta*; *Vanessa io*; *Eugonia polychloros* (one fresh example in the town of Angoulême); *Pararge mæra*, *P. egeria*; *Satyrus circe*, *S. hermione*; *Hipparchia semele*; *Epinephele jurtina*; *Aphantopus hyperanthus*; *Cænonympha arcania*, *C. pamphilus*, [*C. ædipus*]; *Melanargia galatea*.

(To be continued.)

NOTES ON THE VARIETIES OF *PERONEA CRISTANA*, FAB., LATELY IN THE COLLECTION OF THE LATE J. A. CLARK; WITH A REVISION OF THE NOMENCLATURE.

BY SYDNEY WEBB.

(Continued from p. 292.)

STRIANA GROUP.

Dark buttoned, excepting in *insulana*; pale striæ take the place of vitta.

The only new name, introduced by Clark, appropriate to this group was one he adopted from Mr. Bond, who had separated and labelled as distinct a series without buttons, but not otherwise distinguishable from *striana* of Haworth, calling it *prostriana*. This characteristic is sufficient to distinguish any specimen without further description.

Insulana, Curt., Desv.—Comes very near to *striana*, Haw., but it is a darker insect, with large distinct pale cream button, the bone-coloured striations run to the hind margin, and they almost constitute a distinct vitta. Superficially it thus resembles *subvittana*, Steph.

Striana, of Haworth, was doubtless named from the vitta being broken up into ashy coloured lines, which are generally three in number. The first along the inner margin, another from the base following the line of the fold, and a third immediately above the second, which does not begin until the first of the minute tufts before the button. The space between the first and second is more or less filled in with ashy grey, and the chief differences between moths of the *striana* form occur here, as occasionally from two to five subsidiary diverging lines, starting from the third line and below the button, spread fan-like outwards to the end of the wing; but it is not desirable to name any of these.

Desvigne's plan of placing forms of *cristina* in separate groups, although far from satisfactory, is preferable to Doubleday's attempt at a natural sequence. I have followed the former plan, but no effort has been made to place the groups *seriatim*;

those desirous of doing so will, therefore, have to re-arrange the described forms to fit in with their own ideas.

If, for example, one wishes to arrange the aberrations from *striana* as a starting-point, they would follow in sequence thus :—*prostriana*, *striana*, *semistriana*, *substriana*, *brunnea*, *brunneana*, *spadiceana*, *insulana*, *consimilana*, *sericana*, *merlana*, *ulotana*, *desfontainana*, *transversana*, and this would bring us up to *cristana* (vere), omitting the side branch, to *chantana*, &c.

Where description has been necessary, I have kept as closely as possible to Stainton's colour terms, all of which are well known to us. The bracketed portions need no comment, for the names are only given to make the tale of *cristana* varieties complete.

As to the other varieties mentioned in Doubleday's list, but not particularly referred to already :—

Lichenana, Curt., may perhaps be identical with *subvittana*, Steph.

Unicolorana, Desv.—The ground colour of this is mentioned as dark green, which surely cannot refer to any form of *cristana*. The unicolorous pale brown variety, so well known, was placed in all our older collections under this name, and it had better be retained for such forms.

Ruficristana, Johns., was, as we have said, very properly dropped, for its only mark of distinction was the little red spot at the base of the wing. This is frequently present in many of the *cristana* aberrations, notably so in *cristana* (vere), *merlana*, *striana*, *brunnea*, *semiustana*, *subfulvovittana*, and *cristalana*.

Of the foreign aberrations mentioned in Clark's list, *rossiana*, Fab., dates back to 1794, and may have been a stunted specimen of *cristana*, whilst the other—*albicostana*, Sand—is evidently one of the *curtisana* group, unknown to us as British. These should be expunged from our catalogues.

On the other hand, a look-out should be kept for other specimens of the following, which are at present represented in my collection by single examples :—

1. An insect, like a large *desfontainana*, with pale mottlings at the ends of the wings ; no rufous line above the central orange dash, a whitish costal half fascia ending at the button, and vitta entirely wanting.

2. A modification of *desfontainana*, with *subvittana* basal blotch.

VIVIPARITY IN LEPIDOPTERA.

BY F. N. PIERCE, F.E.S.

SOME two years ago, whilst staying with the Rev. C. R. N. Burrows, we paid some little attention to the wax pouch of female *Parnassius apollo*, and in the course of making one of the

preparations, I found a perfectly formed larva in the female body. I at once announced the fact to him that *P. apollo* brought forth its young alive; but after discussing the matter, we both came to the conclusion that the fertilized ovum had just missed being laid before the mother had been killed, and the egg had subsequently hatched. This larva was exhibited at a meeting of the City of London Entomological Society, without any doubt being expressed against its being the larva of the species under examination.

The other day I mounted a pair of *Colias edusa*, when I again observed a fully developed larva in the oviductus communis curled round, the head and tail touching, thus forming a ring. I communicated this to Mr. Burrows, and on my arrival at his house a few days ago, we examined the remaining three specimens of female *P. apollo*, one of which contained a fully developed larva, the other two, only eggs. Mr. Burrows then turned to a pamphlet sent him by Mr. L. B. Prout, a reprint of Mr. N. J. Kusnezou's article in Russian on "The probable Viviparity in some Danaid, *i. e.* Pierid, Butterflies," in which he tabulates his similar experiences, and mentions several species of the genus *Colias* and others having the gift of viviparity. As he does not mention *Parnassius apollo*, I think it is as well to put on record the fact that this species also belongs to this viviparous group.

1, The Elms, Dingle, Liverpool: August 31st, 1911.

RHYNCHOTA INDICA (HETEROPTERA).

By W. L. DISTANT.

Fam. LYGÆIDÆ.

Lethæus notabilis, sp. n.

Head black, opaque, ocelli red; antennæ sordidly stramineous, bases of third and fourth joints piceous; pronotum and scutellum shining dark castaneous or black, anterior margin, extreme lateral margins, and lateral angles of the former pale ochraceous; clavus and corium pale shining ochraceous; two spots on inner claval margin, one near base the other beyond middle, corium with a spot on basal area, an irregular transverse black fascia near inner angle, enclosing a small ochraceous spot, and the apical angle shining black; membrane subhyaline with the veins brownish; body beneath castaneous; rostrum and legs pale ochraceous; head including eyes a little more than half the width of pronotum at base; ocelli nearly touching the eyes; antennæ with the basal joint slightly shorter than head, second joint much longer but not quite twice as long as first, third and fourth subequal in length, each slightly shorter than second; pronotum somewhat thickly finely punctate, transversely

constricted before the middle, the posterior angles rounded and slightly nodulose, the lateral margins nearly straight and moderately oblique; scutellum a little longer than broad at base, finely punctate, distinctly longitudinally ridged near each lateral margin; clavus with several longitudinal series of punctures; corium somewhat sparsely punctate, the punctures mostly in longitudinal series; membrane with four veins connected at the basal cell; rostrum reaching the posterior coxæ; sternum distinctly punctate; posterior tibiæ distinctly finely spinulose, posterior tarsi with the first joint longer than the two remaining joints together. Long. $4\frac{1}{2}$ millim.

Hab. Ceylon; Sigirya (E. E. Green).

Allied to *L. crassiceps*, Dohrn.

Fam. CAPSIDÆ.

ERNESTINUS, gen. nov.

Head broader than long; eyes almost touching the anterior margin of the pronotum, each extending slightly beyond the anterior pronotal angles; antennæ inserted in front of eyes, basal joint longly extending in front of head, its apical area moderately thickened, second joint moderately thickened, about or almost twice as long as first; pronotum about as long as breadth at base, excluding the anterior area convexly rounded and there thickly punctate, anterior area distinctly foveolate near middle, posterior margin truncate, not covering base of scutellum; scutellum small, triangular, somewhat transversely impressed at basal margin; corium about twice as long as broad, lateral margins nearly parallel, very slightly rounded; cuneus narrow, longer than broad; membrane considerably passing abdominal apex, with a large somewhat subquadrate basal cell; legs moderately slender, not spinulose.

Closely allied to the Neotropical genus *Pseudobryocoris*, Dist., but differing in the truncate posterior margin of the pronotum, the scutellum being thus quite uncovered.

Ernestinus mimicus, sp. n.

Head, pronotum and scutellum black; antennæ with the first and second joints black, basal area of the first and the remaining joints very pale stramineous; corium shining whitish hyaline, a transverse fascia inwardly widened a little beyond middle of corium, and the clavus, black; cuneus greyish white; membrane greyish white, the basal cellular areas shining fuliginous; body beneath shining black; rostrum, coxæ and legs pale stramineous; rostrum reaching the posterior coxæ; pronotum, excluding anterior area, very thickly punctate; other characters as in generic diagnosis. Long. $3\frac{1}{2}$ millim.

Hab. Ceylon; Haragama (E. Ernest Green). "On aroid plant, banks of river."

This species in general appearance, coloration and markings almost absolutely resembles *Pseudobryocoris bicolor*, Dist., from Panama (*cf.* Biol. Centr. Amer. Rhynch. i. p. 286, tab. xxviii. fig. 3), the structure of the posterior margin of the pronotum

and the colour of the anterior collar to pronotum alone separating it. It cannot, however, be regarded as a case of mimicry, the habitats of the two species being too wide apart to afford any *raison d'être* for the theory.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

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(Continued from p. 262.)

KOLBE'S CLASSIFICATION (1908).

I. Suborder **Adephaga**, with one family-group.

Families: Carabidæ, Paussidæ, Rhysodidæ, Amphizoidæ, Hygrobiidæ, Haliplidæ, Dytiscidæ, Gyrinidæ.

To the characters of this suborder Kolbe adds the following: Prothorax with shield-like notum and distinct lateral margin, pleuræ very distinctly separated from the notum and from the sternum, and the epimeron separated by a distinct suture from the episternum.

II. Suborder **Heterophaga** (= **Polyphaga**).

Division A. HAPLOGASTRA.

Family-group: Staphylinoidea. Families: Those recognized by Ganglbauer somewhat differently arranged, with the addition of Anisotomidæ and ? Ectrephidæ.

Family-group: Actinorhabda. Families: Synteliidæ, Passalidæ, Scarabæidæ.

Division B. SYMPHYOGASTRA.

AA. Subdivision ARCHOSTEMATA, with one family-group.

Family: Cupedidæ.

BB. Subdivision SYNACTOSTEMATA.

A. HETERORRHABDA.

PELMATOPHILA.

Family-group: Malacodermata. Families: Drilidæ, Lampyridæ, Lycidæ, Cantharidæ (= Telephoridæ).

Family-group: Trichodermata. Families: Malachiidæ, Mellyridæ, Corynetidæ, Derodontidæ, Cleridæ.

Family-group: Palpicornia. Family: Hydrophilidæ.

Family-group: Dascylloidea. Families: Psephenidæ, Helodidæ, Ptilodactylidæ, Eubriidæ, Eucinetidæ, Dascillidæ, Arte-

matopidæ, Lichadidæ, Rhipidoceridæ, Chelonariidæ, Byrrhidæ, Nosodendridæ, Dermestidæ, Heteroceridæ, Dryopidæ, Helmidæ, Georyssidæ, Cyathoceridæ.

Family-group: Sternoxia. Families: Cerophytidæ, Cebri-onidæ, Plastoceridæ, Dicronychidæ, Elateridæ, Eucnemidæ, Throscidæ, Buprestidæ.

BOSTRICHOIDEA.

One family-group. Families: Lymexylonidæ—Sphindidæ, Aspidophoridæ, Cioidæ—Ptinidæ—Lycetidæ, Psoidæ, Anobiidæ—Bostrychidæ.

HETEROMERA.

One family-group. Families: Melandryidæ, Mordellidæ, Rhipidophoridæ, Cephaloidæ, Œdemeridæ, Pythidæ, Anthicidæ, Pedilidæ, Xylophilidæ, Pyrochroidæ, Meloidæ, Salpingidæ, Petri-idæ, Monommidæ, Nilionidæ, Trictenotomidæ, Othniidæ, Lagriidæ, Cistelidæ, Tenebrionidæ, Ægialitidæ, Tentyriidæ.

B. ANCHISTOPODA.

Family-group: Clavicornia. Families: Cucujidæ, Monoto-midæ, Nitidulidæ, Byturidæ, Ostomidæ (- Trogositidæ)—Crypto-phagidæ, Atomariidæ, Mycetophagidæ, Phalacridæ, Catopochro-tidæ, Erotylidæ—Lathridiidæ, Thorictidæ, Gnostidæ, Adimeridæ, Colydiidæ, Endomychidæ, ? Pseudocorylophidæ, Coccinellidæ.

Family-group: Phytophaga. Families: Prionidæ, Ceram-bycidæ, Chrysomelidæ, Bruchidæ.

Family-group: Rhynchophora. Families: Rhinomaceridæ, Anthribidæ—Platypodidæ, Scolytidæ—? Proterrhinidæ, ? Agly-cyderidæ—Brenthidæ, Oxycorynidæ, Rhynchitidæ, Apionidæ, Brachyiceridæ, Curculionidæ.

As distinguishing characters of the suborder Heterophaga, Kolbe gives the following amongst others:—Prothorax with shield-like notum, and either with distinct lateral edge or the pleuræ more or less fused with the notum, and in extreme cases (Rhynchophora) fused also with the sternum, the sides then rounded; the episterna and epimera almost always fused (ex-ception, Passandrini).

With regard to these, it seems to me that Kolbe has missed the one essential character of the prothorax that serves to dis-tinguish the Adephaga from the Polyphaga (- Heterophaga). This is, as I have already pointed out, the presence in the Ade-phaga of a more or less distinct suture between the pleuræ and the notum, and the absence in the Polyphaga of any such suture. In the Adephaga there is generally a suture between the epi-sternum and epimeron of the prothorax, but it is wanting in some of the families. It is never, I believe, really present in the Polyphaga. In the Passandrini, mentioned by Kolbe as an exception, there is to be seen an impressed line in a similar

position, but this line can hardly be, and certainly does not appear to me to be, a true suture. It is more likely to be a secondarily acquired character, having no such significance as that which Kolbe assigns to it, namely, that it is in the Passandriini, as in the Adephaga, a primitive character in which both resemble the Urcoleopteron.

The most noteworthy points in which Kolbe's classification differs from that of Ganglbauer are: (1) the inclusion of the Cupedidæ as a group in the suborder Polyphaga; (2) the division of the Polyphaga into the Haplogastra and Symphyogastra (distinguished chiefly by the separation in the one, and the fusion in the other, of the sternites and pleuræ of the second and third abdominal segments), and the inclusion of the Synteliidæ and Lamellicornia in the division Haplogastra; (3) the recognition, as separate family-groups of the Malacodermata, Trichodermata, Dascylloidea, Sternoxia, Bostrychoidea, and Clavicornia; (4) the placing of the Clavicornia in the same subdivision as the Phytophaga and Rhynchophora, with the Heteromera coming between the Clavicornia and the other groups which Ganglbauer included with them in his single family-series Diversicornia.

We have already discussed Kolbe's reasons for adopting the course indicated by points 1 and 2. The splitting up of the Diversicornia into a number of separate groups is, no doubt, desirable, and would be a great convenience if it could be attained with any great success. Kolbe and Lameere have both attempted it, but not with the same results; and I am inclined to think that, in the present state of our knowledge, Ganglbauer was wise to wait before going any further in that direction.

(To be continued.)

NEW SPECIES OF BOARMIINÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Continued from p. 297.)

Alcis tripartaria, sp. n.

♀. Fore wings whitish, basal and outer thirds suffused with greyish and clouded with tawny; a short black subbasal line, and a black mark below it on dorsum; antemedial line black, indented below middle; postmedial line black, angled below costa and again above dorsum; a black shade-like, irregular line before the postmedial, angled and expanding on costal area; subterminal line of the ground colour inwardly edged and shaded with black; a large black spot extending from postmedial line to subterminal line, placed just under upper angle of the former; two black spots in a blackish cloud on termen below apex; fringes greyish, chequered with blackish, an interrupted black line at their base. Hind wings

whitish, freckled with grey; discal mark and postmedial line black, the latter slightly angled below costa and above dorsum; dusky shade-like subterminal band; fringes greyish, interrupted line at their base black. Under side whitish, freckled with greyish, discal spot black; transverse lines as above, but less distinct; black edging of subterminal line broader; hind wings as above.

Expanse, 34 mm.

Collection number, 794.

Two female specimens from Arizan (7500 ft.); one taken September 15th, 1906, the other in August, 1908.

Alcis fucataria, sp. n.

♂. Fore wings white, freckled and suffused with greyish brown on basal and costal areas; antemedial line blackish, only distinct on costa and towards dorsum, enclosing a pinkish brown basal cloud; postmedial line black, undulated; discal mark black, a dusky line above it to costa and below it to dorsum; subterminal line whitish, wavy, inwardly shaded with blackish except towards costa; the area beyond postmedial line greyish brown, tinged with pinkish. Hind wings white, slightly freckled with greyish brown; antemedial line greyish brown, almost straight, not extending to costa; postmedial line black, tapered and faint towards costa; subterminal line whitish, inwardly shaded from dorsum to just above middle with blackish, the area beyond greyish brown, enclosing a pinkish brown cloud above tornus. Under side pale ochreous brown; fore wings freckled with dark grey on costal area, and suffused with dark grey on apical portion of outer area; postmedial line as above, but dark grey, and not so distinct, followed by a dark grey line almost parallel with termen, and marked with black on the veins; discal mark blackish, curved; hind wings with a dark grey, curved, postmedial line; traces of dusky antemedial and subterminal lines; discal dot black, minute.

♀. Similar to the male, but all the wings more completely freckled with greyish brown; on the under side the lines are indistinct, and the dark grey suffusion of outer area extends almost to dorsum.

Expanse, ♂ 44 millim., ♀ 42 millim.

Collection number, 796.

One example of each sex from Arizan (7500 ft.), September, 1906.

This species comes near *A. tendinosaria*, Brem.

Alcis undularia, sp. n.

♀. Fore wings white, slightly freckled with brownish on medial third; basal and outer thirds greyish brown, freckled and clouded with blackish; antemedial line indistinct; medial line brown, black and expanded on costa, projected inwards above middle; postmedial line black, undulated, terminating just beyond middle of dorsum, which is tinged with ochreous brown; the veins beyond postmedial line marked with black; subterminal line white, wavy, shaded inwardly with blackish; a whitish patch beyond subterminal between

veins three and four, and opposite this a greyish brown streak extends to antemedial line. Hind wings white freckled with brownish; antemedial line greyish brown, broad, and nearly straight; postmedial line greyish brown, curved towards dorsum, tapered towards, but not extending to, costa; subterminal line white, shaded with greyish brown, deeply angled outwards about middle. Fringes greyish brown, paler between the veins, except towards apex of fore wings, preceded by black wavy line. Under side white, costal area of all the wings tinged with ochreous; fore wings flecked with brown on costa and clouded with blackish on basal third; outer third black, enclosing a white spot about middle; transverse lines as above, but faint, as also are those of the hind wings; all the wings have the black discal mark most conspicuous on under side.

Expanse, 49 millim.

Collection number, 793.

One female specimen from Arizan (7500 ft.), September, 1906.

Allied to *A. trikotaria*, Feld.

Alcis argillacearia, sp. n.

♂. Fore wings pale ochreous brown, central area limited by the transverse lines, paler, almost white; basal and outer areas mottled with blackish; antemedial line black, slender, nearly straight; discal mark linear, black, placed on the inner edge of a black mottled brown cloud; postmedial line black, incurved below costa, black points on its outer edge; subterminal line whitish, wavy, indistinct. Hind wings pale ochreous brown, whiter towards base, freckled with darker; the only distinct markings are a brownish discal dot, a brownish postmedial line not extending to costa, and some brown clouds on outer area. Under side similar to above, but fainter.

Expanse, 46 millim.

Collection number, 1570.

A male specimen from Arizan (7300 ft.), August, 1908.

BY THE WAY.

THE season is over! And how remarkable a one has the present season been—the brilliancy of May giving way to a short cool snap in June when “things” should have been abroad in their greatest numbers, and then the incessant heat thence till a week or so ago! At first the high temperature was most beneficial for collecting, but towards the end of July herbage began to flag in the continued drought, and in August the New Forest was badly burnt up by the sun, which was no less felt on the coast than inland; far fewer insects were to be met with at Southwold in September than in the cold and rainy corresponding period of last year.

From a popular point of view, wasps have been the most remarkable feature of the season, and we have all played 'Punch's' New Garden Game, "Slicing the Wasp." Many deaths from their stings are reported from Bedford, Erdington, Norfolk, &c., none directly fatal, unless inflicted in the mouth; while a horse worth thirty pounds died from a sting—presumably one only—at Market Bosworth. No cause but the hot, dry spring is known to account for the prevalency of the pest; in our garden were five nests, in a single Suffolk churchyard were thirteen, and twenty-one were destroyed at Aldeburgh in three days. The Southgate Urban Council appointed an Official Wasp-catcher, who thought twenty-seven nests a fortnight towards the end of August good work. The rarer *Vespæ* have also been in evidence, and *V. norvegica* is reported from Beccles.

The fourth of the Local Government Board's Reports on flies as carriers of infection contains much matter of interest to "practical" entomologists, those interested in species directly affecting the lord of creation. How long flies of sorts remain infectious after receiving the microbes, how the eggs of parasitic worms are transmitted to and from them, and the distance to which disease may be conveyed within a given period, are dealt with. Clark and Alexner also consider, in the Journ. Amer. Med. Assoc., June, 1911, the contamination of flies with the virus of epidemic poliomyelitis. The *précis* in the Brit. Medical Journal of August 19th is capital.

The Memorial of influential Naturalists, recently presented to the Premier, has done its work. We read in the 'Morning Post' of September 5th:—"A compromise in a long-standing dispute as to the Government Museum sites in South Kensington and their future development has been arrived at. . . . The settlement now reached provides for the grounds of the Natural History Museum remaining intact, while the Science Museum will be erected on the land to the north of the boundary fixed in 1899. 'It is only a triumph of patient perseverance, backed up by facts and influential support.'" The 'Times' of the 4th considers the arrangement "one which is satisfactory to the Trustees of the British Museum, inasmuch as by the terms of the settlement the Natural History Museum retains all the land allotted to it in 1899, and the boundary then agreed upon is not to be disturbed," so the very necessary expansion is allowed ample space.

Verrall is dead! UNHELM.

C. M.

NOTES AND OBSERVATIONS.

THE NATURAL HISTORY MUSEUM, SOUTH KENSINGTON. — Some months back an article appeared in this Magazine, dealing with the alleged intentions of the Government to appropriate the extensive site of the "Natural History Museum" to the uses of a projected new "Science Museum." The matter, we are glad to say, has now been settled agreeably to the interests of all parties; the Natural History Museum retains its only possible area for expansion; the Science Museum is relegated behind the northern limit of the Museum enclosure. We owe our best thanks, therefore, to the energetic naturalists who promoted the petition to the authorities for a re-hearing of the case. Their efforts have been entirely successful; and all that remains for the Government to do is to sanction the much needed additions to the building in which, at present, the Entomological Department is "cribbed, cabined, and confined."—H. R.-B.

MR. EUSTACE R. BANKES, having been ordered complete rest by his doctors, in consequence of a severe nervous breakdown, hopes that his correspondents will kindly refrain from writing to him, or sending him insects for identification, &c.

THE NATURE OF MELANISM.—Mr. Leigh (*antea*, p. 163), speaking of the dark colour of some species of moths, says: "While in others it may be of physiological importance, and associated in some way with constitutional hardiness." This reminded me of an incident I once witnessed, which seems to bear on this point. In the spring of, I think, 1897, being anxious to get ova of *Chimabacche fagella*, I brought home one female and two males. One of them was of the pale grey form, and the other was a very dark specimen. I placed them in a cage together with the female, and later, towards dusk, I looked into the cage. The grey male was just in the act of pairing with the female, but before he had finally clasped her the dark male ran up the back of the cage, brushed the grey one aside, and paired with the female. The grey male did not show any fight at all. There may, of course, have been some preliminary skirmishing, but all I saw was the finish of the fight, if there had been one. During the short time that this action was taking place the female appeared perfectly indifferent to what was happening. If it could be shown that when a dark and a light male form contend for a female the dark form is usually victorious, another factor would be added to our knowledge of the production of melanic and melanochoic forms.—ALFRED SICH; Corney House, Chiswick, Middlesex, Sept. 5th, 1911.

CATEREMNA TEREBRELLA, Zk. — I was pleased to read in last month's 'Entomologist' of the occurrence of this, at present, little-known "knothorn" in Devonshire. I bred and duly recorded (*Ent. Mo. Mag.* xlii. 180) a specimen from a spruce-fir cone picked up in Surrey when collecting a few cones for the purpose of breeding *Cydia strobilella*. This emerged on July 3rd; another appeared July 30th, and a third August 1st. After an interval of a month, finding that no more came out, and wishing to see a pupa-case, I opened the few cones I possessed, duly found the empty pupæ, and somewhat to my

surprise, in almost the last cone, a larva apparently about half-grown; this was, of course, placed back in the flower-pot, and eventually came out a fine female on June 14th in the following year (1907). Four specimens altogether were thus bred from the few cones picked up in the spring of 1906. I have searched most assiduously each year, but, strangely enough, have never found one since! From the fact that there is no outward visible sign of the larva within, unlike the other two cone-feeding "knothorns," *Dioryctria splendidella* and *D. abietella*, F., I expect the insect is very much overlooked. From this note it will be seen that it is inadvisable to throw the cones away without a careful examination. — A. THURNALL; Wanstead, Essex, September 9th, 1911.

NOTE ON LARVA OF AGROTIS RIPE.—On the sandhills about Palling, East Norfolk, this year were swarms of *A. ripe* feeding on the sea-bindweed. While collecting a number of them I found, to my surprise, that they were several times able to bite my hand sufficiently hard to cause sharp pain. In every case they bit between the fingers, presumably in an attempt to burrow through and escape. I have never noticed this characteristic in any other larva, but it may be for want of observation.—CHARLES MELLOWS; Bootham School.

HYBERNATION OF *P. ATALANTA*.—In view of recent notes on the above subject, it may be of interest to note that on June 9th, 1910, I took a perfect specimen of this butterfly in the house here.—E. F. STUDD; Oxtou, Exeter, September 12th, 1911.

EARLY APPEARANCE OF *EREBIA EPIPHRON* var. *CASSIOPE* AND *PARASEMIA PLANTAGINIS* IN WESTMORLAND.—On June 7th this year I took eighteen specimens of *E. epiphron* var. *cassiope*, and saw about as many more, on a mountain not far from Helvellyn. They were flying at an elevation of about two thousand feet. They were all males, the females apparently not having emerged. I have usually taken this insect, in the same locality, in fresh condition from June 22nd to the end of the first week in July, according to the seasons. Along with *cassiope*, I took a few and observed many more *P. plantaginis* males, and also one var. *hospita*. At this elevation the species and its variety are usually fresh out in the first week in July in this particular locality. — B. H. CRABTREE; Cringle Lodge, Levenshulme, Manchester.

EARLY DATE FOR *CÆNONYMPHA TYPHON* (DAVUS).—On the mosses near Hoverthwaite (Lanc.), I obtained *Cænonympha davus* var. *rothlebi* on June 5th, although in 1896 I took this insect as early as May 30th, but the latter date was very exceptional, and I should think almost constitutes a record. This year *davus* was out fully a fortnight earlier than in normal seasons.—B. H. CRABTREE.

BLACK ABERRATION OF *DASYCHIRA PUDIBUNDA*.—I took a beautiful black male specimen of *Dasychira pudibunda* in my moth-trap on June 9th last year, and a friend of mine, who resides about a mile from here, had one in his moth-trap this year. I had never seen or heard of this variety before.—(Major) R. B. ROBERTSON; Fairlawn, Chandler's Ford, September 8th, 1911.

TORTRIX PRONUBANA.—Having read and digested Mr. Adkin's remarks on this moth, I determined to try my luck at such seaside places as I could get at. *Tortrix* larvæ at Bournemouth in May were as the sands in number, but none of those I took were of the desired kind. Being at Weymouth in August, I tried again, and, returning home with my spoils, I found emerged yesterday afternoon a small but unmistakable female *pronubana*.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford, September 10th, 1911.

LYCÆNA ICARUS ab.—On August 13th, in the same field referred to in my record of *C. phlæas* ab. *alba*, I took an aberration of *Lycæna icarus*, in which the spots on the under side of the hind wings are almost obsolete, the basal series being represented by two minute dots, and the submedian by one spot (the sixth).—HAROLD B. WILLIAMS; 82, Filey Avenue, Stoke Newington, N., Sept. 5th, 1911.

CHRYSOPHANUS PHLÆAS ab. *ALBA*, Tutt, in BUCKS.—I captured a perfect male specimen of *C. phlæas* ab. *alba* in a chalky field near Little Missenden, Bucks, on Aug. 12th last.—HAROLD B. WILLIAMS.

CHRYSOPHANUS PHLÆAS var. *SCHMIDTII* in LANCS.—I should like to record that on July 31st, 1911, I took a specimen of *Chrysophanus phlæas* var. *schmidtii*, in very fair condition, in Church Road, St. Anne's. I believe this is the first one captured in this place, although one was seen before in 1908. Also on July 6th I took an almost black *Satyrus semele* (male); is this a named variety?—J. W. MUIRHEAD; 31, Fairhaven Road, St. Anne's-on-the-Sea, September 7th, 1911.

CHRYSOPHANUS PHLÆAS var. *ELEUS* at COLCHESTER.—On Friday, August 25th, worn specimens of *C. phlæas* were common on *Inula* flowers, and a single specimen of a new brood heralded the coming of the next generation. Among the worn ones was an insect which I could not make out, until I saw too late that it was a very dark male *C. phlæas* var. *eleus*, for it vanished the moment I realized what it was. Its dark appearance may have been due to its being somewhat worn perhaps. In any case, I tried to solace myself with that conclusion, after watching for some time in the vain hope of its return.—W. H. HARWOOD; 94, Station Road, Colchester.

VARIETIES OF CHRYSOPHANUS PHLÆAS AND DIANTHÆCIA CONSPERSA.—On September 9th, 1911, I saw a small "copper" with hind wings quite black, no trace of copper being visible. It was settled on a flower, and, being without a net, I was fortunate in securing it by enclosing it between the top and bottom of an open pill-box. During the summer I bred a *D. conspersa* in which the usual pale markings were almost black.—A. J. SPILLER; Godolphin Cross, Helston.

PAPILIO MACHAON at COLCHESTER.—Two fine larvæ of *P. machaon* were found feeding on carrot-leaves in an allotment here, and the following week another was brought me which had been discovered feeding on *Dictamnus fraxinella-alba* in one of Mr. R. W. Wallace's flower-fields near my house. This has since produced a fine light-

coloured female. Two other specimens were seen on the wing in other parts of the town. The ova from which these originated must have been laid by a female which had wandered from its native haunts, or by a specimen which escaped or was liberated after pairing. In any case, these occurrences seem worth recording.—W. H. HARWOOD; 94, Station Road, Colchester, September 8th, 1911.

PIERIS RAPÆ AND *P. napi* TRIPLE-BROODED IN 1911.—Third broods of *Pieris rapæ* and *P. napi* abounded at the end of August, and are still common.—W. H. HARWOOD; 94, Station Road, Colchester, September 8th, 1911.

Specimens of a third brood of *P. napi* and of *P. rapæ* were to be taken in Northamptonshire in mid August, the second brood appearing as early as the hay harvest.—CHARLES MELLOWS; Bootham School.

A male specimen of *P. rapæ* emerged on August 30th, and a female on September 3rd, both from larvæ reared in the garden here. Other larvæ fed up at the same time, and duly pupated, but up to this date (September 13th) no more butterflies have appeared.—H. GARRETT; 21, Angell Road, Brixton, S.W.

I have noticed fresh specimens of *Pieris rapæ* on July 5th (female) and September 5th (male and female) at St. Anne's. Is not the latter probably a third brood?—J. W. MUIRHEAD; 31, Fairhaven Road, St. Anne's-on-the-Sea, September 5th, 1911.

VANESSA IO DOUBLE-BROODED IN 1911.—On September 6th I found a large brood of nearly full-fed *V. io* larvæ feeding on a patch of low nettles which had been mown off and were freely springing up again. So far as I know, the only other recorded second brood in Britain is that mentioned in South's 'Butterflies of the British Isles.'—W. H. HARWOOD.

THIRD BROOD (?) OF PAPILIO MACHAON.—The exceptional summer seems likely to produce three broods of *P. machaon* this year. In previous years I have always obtained half-grown larvæ of the second brood at Hickling about August 15th. This year, on the same date, I found eggs and young larvæ from females of the second generation, and these are already (September 1st) nearly full-grown.—C. MELLOWS; Bootham School.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—I obtained three perfect specimens of *A. exclamatoris* at sugar on September 8th last. Is this species normally double-brooded?—J. S. CARTER; Iden, Sussex.

[*Agrotis corticea* has been occasionally noted in September, but we do not recall any record of *A. exclamatoris* having been captured in this month. In 'Barrett,' however, there is a record of a casual emergence of the last-named species in October.—ED.]

HADENA PISI IN SEPTEMBER.—Eight perfect specimens of *H. pisi* came to sugar on September 15th.—L. W. NEWMAN; Bexley, Kent.

LARVA OF ARCTIA CAIA FULL-GROWN IN SEPTEMBER.—Three larvæ of *A. caia* were found on September 16th while searching for *Pyrameis*

atalanta. Of the latter, I may mention that on September 16th I obtained imagines, larvæ in all stages, and pupæ.—L. W. NEWMAN.

CERURA FURCULA IN AUGUST.—Small larvæ of *C. furcula*, picked up at the beginning of July, attained the imago state in early August.

NOTODONTA DROMEDARIUS IN LATE JULY.—Larvæ of this species, obtained at the same time as the *C. furcula* mentioned above, produced imagines at the end of July.

HYGROCHROA (PERICALLIA) SYRINGARIA IN SEPTEMBER. — I obtained ova from a female *H. syringaria* at the end of June last. The larvæ from these were sleeved on privet, and about a score fed up rapidly, pupated, and produced exceptionally fine imagines during the second week of September. The rest of the larvæ remain small, and evidently intend to hibernate in the usual course.—L. F. BURT; Aryke, Shifnal, Salop.

[All three of the species referred to by Mr. Burt are known to be partially double-brooded in favourable years.—ED.]

ACRONYCTA ALNI AND ABRAXAS GROSSULARIATA ab. LACTICOLOR IN WARWICK.—On August 24th I took in my garden here a specimen of *Abraxas grossulariata* ab. *lacticolor*. On the following day a larva of *Acronycta alni*, taken from a hazel-bush in a garden in this town, was brought to me, and within a few hours pupated in a piece of cork.—LLOYD CHADWICK; 7, Northgate Street, Warwick.

MACARIA LITURATA var. NIGROFULVATA IN WARWICKSHIRE.—Referring to Mr. J. Arkle's note in the September number of the 'Entomologist,' I should like to record having taken within the last five years two specimens of this variety (one at sugar) in Oakley Wood, near Warwick. The record of one of these captures, already given in 'Moths of the British Isles,' was taken from the 'Proceedings' of the Birmingham Natural History Society, in which unfortunately the locality of the wood was omitted.—LLOYD CHADWICK.

PLUSIA MONETA IN BALHAM.—I captured on June 21st, 1911, a specimen of *Plusia moneta* in my garden, hovering over a plant of *Delphinium*.—E. SHARPE; 28, Balham Park Road, S.W.

COLIAS HYALE IN BUCKS.—On September 2nd I had the good fortune to capture two specimens of *Colias hyale* in a lucerne field in the Hugenden district; one was in good condition, but the other somewhat worn. I visited the same field next day, but no more of these butterflies were to be seen.—W. GANDY; "Ravenscroft," Priory Avenue, High Wycombe, Bucks, September 12th, 1911.

COLIAS HYALE IN ESSEX.—On September 1st, at Ashingdon, Essex, I met with a solitary male *C. hyale* flying over lucerne. Although I visited some large lucerne fields in full bloom, I saw no others.—F. W. FROHAWK; September, 1911.

COLIAS HYALE IN KENT.—On August 29th I saw, but did not have an opportunity of securing, a specimen of *C. hyale* in a lucerne field near here. On August 30th I saw two *hyale* and caught one;

on September 2nd I saw three and caught two; and on the 5th saw two and caught both. Curiously enough these insects were all in two fields of lucerne, and though I have carefully worked all the lucerne fields around here, I have seen no other specimens of the butterfly.—H. HUGGINS; 17, Clarence Place, Gravesend, September 11th, 1911.

COLIAS HYALE IN KENT.—This species was obtained at Dover on August 26th.—H. FLEET, Junr.; 7, Park Road, Esher.

COLIAS HYALE in KENT.—I have taken this year, in the vicinity of Herne Bay, between August 20th and 27th, twenty-three fine specimens of this species.—W. H. C. BOLTON; 48, Philbeach Gardens, Earl's Court, S.W.

COLIAS HYALE IN KENT.—I spent the month of August at Margate, in company with my son, Mr. Reginald Spiller, who resides in that town. We made many collecting expeditions, and on the 16th I was agreeably surprised by taking a fine female *C. hyale*. After that, to the 19th inclusive, we captured eleven more, all in lucerne fields. Then for some reason they became very scarce, and to the end of the month, when I returned home, we only saw three specimens, one of them being at Sandwich. However, my son informed me that they re-appeared during the first week in September. He sent me on eleven fine specimens which he had taken, so that my series of Margate specimens now amounts to twenty-three. There were eight females amongst them, two of the same colour as the male, four paler yellow, and two white.—A. J. SPILLER; Godolphin Cross, Helston.

COLIAS HYALE IN ESSEX.—Yesterday (September 18th) twenty-seven *C. hyale* were captured at Ashingdon, by Mr. Charles Cork, who showed me the specimens, all of which are males. We visited the same locality to-day and captured five more, three males and two females, all freshly emerged. The lucerne in the neighbourhood has recently been cut; only a very little bloom remains in places, otherwise there is little doubt many more specimens would have been seen.—F. W. FROHAWK; Rayleigh, September 19th, 1911.

COLIAS HYALE IN EAST NORFOLK.—*C. hyale* occurred in some numbers near Palling, on August 12th, this year. A strong east wind was blowing at the time, and it was during the hottest of the August heat-wave. They stayed in the local clover-fields for three days and then went inland and I saw no more of them. I think they were migrating due west.—C. MELLOWS; Bootham School, York, September, 1911.

COLIAS HYALE IN SUFFOLK.—It may be of interest to record the capture, near Ipswich, on September 10th and 11th, of thirteen specimens of *C. hyale*, in perfect condition, by myself and a friend.—G. D. ARCHER; Whitton, near Ipswich.

At the present time (September 9th) there are large numbers of *C. hyale* in the lucerne fields, but I have not seen any example of *C. elusa* this autumn yet.—WALTER GOODCHILD, Junr.; The Laurels, Norwich Road, Ipswich.

COLIAS EDUSA IN KENT.—I captured a fine male specimen of *C. edusa* on September 16th, near Bexley. Although a thorough search was made throughout the district, no other example of the species was seen.—L. W. NEWMAN; Bexley, Kent.

COLIAS EDUSA IN ESSEX.—A single specimen of *C. edusa* was noticed flying swiftly along a lane here late in August.—W. H. HARWOOD; 94, Station Road, Colchester.

COLIAS EDUSA IN CORNWALL.—One example of *C. edusa* was seen, flying swiftly, in the Penzance district during late August.—G. B. KERSHAW; West Wickham, Kent.

COLIAS HYALE AND SPHINX CONVULVULI IN KENT.—On August 23rd I found a somewhat worn specimen of *S. convolvuli* at rest on a fence between the North Foreland lighthouse and the edge of the cliff. On August 10th I took a magnificent female *C. hyale*, in a lucerne field near Margate; four or five other specimens were seen on subsequent days.—F. H. STALLMAN; 6, Maley Avenue, West Norwood, S.E.

COLIAS EDUSA AND SPHINX CONVULVULI AT SCILLY.—Of butterflies at Scilly in August I saw *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Colias edusa* (2), *Gonepteryx rhamni* (3), *Vanessa urticæ*, *V. atalanta*, *V. cardui*, *Epinephele ianira*, and *Lycæna icarus*. Of these, *G. rhamni* is new to me in the locality. Of moths the total number of species would not much exceed the butterflies. Sugar was a comparative failure, and the only moth other than the commonest was *Sphinx convolvuli*.—B. W. ADKIN; 8, Hope Park, Bromley, Kent.

ARGYNNIS LATHONIA IN KENT.—It will probably be of interest that I should record the capture, on the cliff at St. Margaret's Bay, Kent, on August 13th, 1911, of a very fair specimen of *A. lathonia* (female).—I. C. GUNTON; 20, Sheffield Terrace, Campden Hill, W., August 9th, 1911.

VANESSA ANTIOPA AT BERKHAMSTED, HERTS.—Mr. John Trask, one of the masters at Berkhamsted School, called on me some three weeks ago, stating he had, that day, seen a fine specimen of this insect near Ashley Green, but, having no net, was unable to catch it.—ARTHUR J. ROSE; "Glanmor," Berkhamsted, September 19th, 1911.

VANESSA ANTIOPA IN ESSEX.—Two schoolboys, named L. Taylor and M. Green, who have been spending their holidays at Clacton, captured a good specimen of this insect at Bradwell-on-Sea on August 25th. I have seen this specimen, which is a male in good condition but somewhat damaged on the left fore wing.—ARTHUR J. ROSE.

VANESSA ANTIOPA IN THE ISLE OF WIGHT.—I write to record the occurrence here, at Brading, on August 17th last, of a very fine specimen of *Vanessa antiopa*. It was caught while resting on some flowers in the vicarage garden, and was brought to me. It is now in my collection. I believe another was seen in the neighbourhood

about the same time. I should be very interested to hear if it has occurred elsewhere this year in the Island.—(Rev.) D. S. W. NICHOLL; Lansdowne, Brading, Isle of Wight, September 4th, 1911.

ACHERONTIA ATROPOS IN BERKS. — On July 20th some full-fed larvæ of *A. atropos* were brought to me, found in a garden here. They went to earth as soon as placed in a flower-pot, and a perfect male specimen emerged on September 6th. I think this a very short time to remain in pupa, and suppose the very hot weather was the cause.—W. E. BUTLER; Hayling House, Oxford Road, Reading, September 14th, 1911.

ACHERONTIA ATROPOS IN CORNWALL.—I have in my possession a fine male *A. atropos* that was taken at rest, on September 9th, by a young lady at Gurnard's Head, St. Ives. — LLOYD CHADWICK; 7, Northgate Street, Warwick.

ACHERONTIA ATROPOS IN SUFFOLK.—On the 7th inst. a pupa of *A. atropos* was brought me by Mr. H. Graves of this town; this I placed in damp peat and placed it in my desk which stands over a steam radiator, the temperature at night not falling below 78 deg. This morning, on opening the desk, I found the imago had emerged perfect; it was found when digging up potatoes.—HERBERT WM. BAKER; 73, Limetree Place, Stowmarket, Suffolk, September 11th, 1911.

SPHINX CONVULVULI IN BERKS. — I should like to record the capture of a fine male *Sphinx convolvuli*. It was resting on a brick wall.—H. L. DOLTON; 27, Brunswick Street, Reading, September 13th, 1911.

SPHINX CONVULVULI IN CORNWALL.—A specimen of *S. convolvuli* was picked up on the road to Penzance, about 7.30 p.m., on August 15th. It was a good specimen, but had evidently been injured in some way.—G. B. KERSHAW; West Wickham, Kent.

SPHINX CONVULVULI IN DEVON.—At the flowers of tobacco plants in my garden I captured a specimen of *S. convolvuli* on September 9th and two on the 12th. I also saw one other specimen on the latter date.—J. WALKER; 7, Mount Hermon Road, Torquay.

SPHINX CONVULVULI IN DEVON.—A specimen of *S. convolvuli* came into my house here on August 17th. Another example was flying around a tobacco plant in the garden a few days later.—E. G. HEBBUT; Berrynarbor, S.O., Devon.

SPHINX CONVULVULI IN DORSET.—It may be of interest to readers that between thirty-five and forty specimens of this insect were captured here from August 26th to September 14th. All were taken at rest.—LEONARD TATCHELL; Karenza, Swanage.

SPHINX CONVULVULI IN NORTH ESSEX.—A very large female of this species was brought to me in a very small box a few days ago, and there is no need to describe its condition. I have since heard of several specimens having been taken elsewhere within a ten

miles' radius of Colchester.—W. H. HARWOOD; 94, Station Road, Colchester.

SPHINX CONVULVULI IN HANTS.—Two or three specimens of *S. convolvuli* have been taken in this neighbourhood. One was brought to me by a lady last week. It was a fine female, and was kept for eggs, but died without laying.—(Major) R. B. ROBERTSON; Fairlawn, Chandler's Ford, Hants, September 8th, 1911.

SPHINX CONVULVULI IN THE ISLE OF WIGHT.—This species has been plentiful this season in the Island.—G. NOBBS; North Lodge, Isle of Wight.

SPHINX CONVULVULI IN KENT.—It may be of interest to record the capture of a fine female of this insect on August 29th, flying at dusk round *Nicotiana affinis*. Another specimen was seen on September 3rd in the same place. —GEOFFREY MEADE-WALDO; Hever Warren, Kent.

SPHINX CONVULVULI IN SURREY.—In the evening of September 12th I had a perfect male specimen of *S. convolvuli* brought to me alive. It had flown into the kitchen of a house on the outskirts of Haslemere, doubtless attracted by a strong light in the room. Another specimen, taken at rest on the morning of September 16th, is also in my possession. I may mention that there are a considerable number of petunias and tobacco plants in flower growing near the spot.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere.

SPHINX CONVULVULI IN SURREY.—A specimen of this fine hawk-moth was taken in a garden, High Street, Esher, on September 6th.—H. FLEET, Junr.; 7, Park Road, Esher.

SPHINX CONVULVULI IN SUFFOLK.—Two specimens of *S. convolvuli* were captured, whilst hovering over petunias, on September 12th.—G. D. ARCHER; Whitton, near Ipswich.

SPHINX CONVULVULI IN SUSSEX.—Doubtless many of your correspondents have rejoiced in a good season for this insect, and I should only record the capture of five specimens in this small garden for special reasons. Chief among them is the fact that, although we have some fine plants of *Nicotiana*, a bed of evening primroses seems to be the chief attraction. I would further mention that four out of the five moths have been netted as late as nine o'clock, when I have managed to see them by shadowing the plants against the bright moonlight. My last capture—a female in fine condition—has been rather reluctantly reserved for egg-laying purposes; I say "reluctantly," because I have no experience of obtaining eggs from hawk-moths, and have only the flimsiest hopes of any success.—J. S. CARTER; Iden, Sussex.

SPHINX CONVULVULI IN SUSSEX.—A fine female specimen of *S. convolvuli* was brought to me alive early this month.—WM. DELVES; Horeham Road, Sussex, September 22nd, 1911.

SPHINX CONVULVULI IN WARWICK.—A female specimen of *S. convolvuli* was brought to me on August 28th last. It was found at rest

on a wooden shed in this town on the morning of August 26th. The tips of the fore wings were damaged, owing to the moth having been confined in a small box; otherwise it is a fine specimen.—LLOYD CHADWICK; 7, Northgate Street, Warwick.

H. ARMIGERA AND S. CONVULVULI IN GLAMORGANSHIRE. — I should like to record taking *H. armigera* while sugaring on the sea-coast near Bridgend on August 15th. The moth is in good condition; I only know of one other specimen having been taken in South Wales, viz., by Sir J. T. D. Llewelyn, of Penllergare, near Swansea. There seems to have been a considerable invasion of *S. convulvuli* this year. My son, H. E. David, netted two fine specimens off the flowers of the white tobacco plant, on August 17th and 19th, at the same place as I took *H. armigera*. I also had two other moths given to me, which were found at rest in the daytime, one from Fomoun Castle grounds, Glam., and the other from East Knoyle, Wiltshire.—E. N. DAVID; Yscallog, Llandaff, Glamorgan.

COCCIDÆ AFFECTING RUBBER TREES.—In the 'Journal of Economic Biology,' May, 1911, Mr. E. E. Green has a very interesting paper on Coccidæ found on rubber trees in Ceylon. In two instances, however, I venture to disagree with his nomenclature, as follows:

Cardiococcus castilloæ (Green): *Inglisia castilloæ*, Green, t. c. p. 29.

Lepidosaphes rubrovittatus, Ckll. 1905 (Philippine Is.): *Mytilaspis fasciata*, Green, t. c. p. 31.—T. D. A. COCKERELL.

A SECOND BROOD OF *L. SIBYLLA*.—To-day, while I was hunting for larvæ among young aspens in a wood not far from here, I was greatly surprised to see *Limenitis sibylla* settle on a bramble-leaf close to me. I watched it for some moments while it gently raised and lowered its wings, and then it floated gracefully off to another leaf. "This surely cannot be a retarded specimen," I said to myself; "it is far too late for that; it must be one of a second brood." I went on, and in the course of an hour saw six or seven more, all quite fresh and exceptionally fine. One particularly large female allowed me to approach quite close to her, and I tried to catch her between my finger and thumb as she sat on a leaf, but she would not quite allow this piece of familiarity, and if she had I should not have kept her, as the butterfly is getting very scarce in this neighbourhood. Of course these were all individuals of a partial second brood, due to the abnormally hot, dry summer, but I believe it is an unprecedented event, for I can find no records of any second brood in any of my entomological books, though I have not been through all the back volumes of the magazines. I should like to know if anyone else has ever met with, or heard, of a second brood. It does not appear to be double-brooded on the Continent, though its near ally, *camilla*, is undoubtedly so in the South. The first butterfly I noticed this year was on June 14th. I was in the wood on several occasions during August and the beginning of this month, but there were none about then, so those I saw to-day can only have just emerged.—GERVASE F. MATHEW; Lee House, Dovercourt, September 19th, 1911.

OBITUARY.

ALBERT HARRISON, F.L.S., F.R.M.S., F.Z.S., F.C.S., F.E.S., &c.

As briefly announced in our last number, Mr. Harrison died on August 28th. He was born in 1860 at the New Pale Farm, near Frodsham, Cheshire, and was educated at the Liverpool Institute. In 1875 he went to the laboratory of Messrs. Henry Tate and Sons, sugar refiners, in Liverpool, thence he was transferred to the London branch, of which he became manager in 1878. By the Directors he was held in great esteem, and he won the respect of all with whom he came in contact.

From his boyhood upwards he was keenly interested in Natural History, and as Delamere Forest was just on the border of some of the fields of Pale Farm, he had splendid opportunities for obtaining practical knowledge of the fauna and flora of that locality.

After coming to London he commenced a systematic study of biology, and in 1888, in co-operation with his friend Mr. Hugh Main, began the collection and study of insects generally, and of Lepidoptera specially. Joining the South London Entomological and Natural History Society in 1892, he soon became acquainted with all its active members. One immediate result of this was that the rearing of insects from the earlier stages became a feature of his labours. He was also attracted by the work being done in connection with Mendel's laws of heredity, and applied his experience and facilities to experiments in this direction. The local variation of *Pieris napi* was a subject in which he had been interested for some time, and unaware of previous investigations on the same lines, he tried the effects of crossing the var. *bryoniæ* from Switzerland with British *napi*. The results were very interesting, but so far no explanation of them on Mendelian lines has been found (see Trans. Ent. Soc. Lond. 1908). Another species, on the variation of which experiments were made, was *Aplecta nebulosa*. Mr. Harrison collected the larvæ of this species in Delamere Forest, where vars. *robsoni* and *thompsoni*, together with the grey form, occur. It appeared from the results of a number of crossings that it was a parallel case to that of the Blue Andalusian Fowl; but from the results obtained this year the matter does not seem quite so simple, and further experiments are still required to elucidate it (see Trans. Ent. Soc. Lond. 1911).

Mr. Harrison was taken suddenly ill on the evening of August 27th, and passed away about 1.30 a.m. the next day from hæmorrhage on the brain.

He will be greatly missed by a large circle of friends, to all of whom he had endeared himself by kindly words and generous deeds.

WE have to announce, with very deep sorrow, that our colleague, Mr. GEORGE HENRY VERRALL, died on September 16th.

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THE ENTOMOLOGIST

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[No. 582

GEORGE HENRY VERRALL, F.E.S.

(PLATE VIII.)

GEORGE HENRY VERRALL, of Sussex Lodge, Newmarket, who died on September 16th after a somewhat long and harassing illness, was born at Lewes on February 7th, 1848, and was therefore in his sixty-fourth year. Educated at the Lewes Grammar School from 1857 to 1864, his early taste for entomology and botany was fostered in a congenial atmosphere among the beautiful Sussex Downs, which have inspired with the true love of Nature so many of her most ardent disciples.

At first secretary to his eldest brother, the late Mr. Fred. Verrall, he afterwards joined the well-known firm of racecourse managers and bankers, Messrs. Pratt & Co., and was concerned as auctioneer with the sale of many famous racehorses. And in this connection it is interesting to know that from among the heirlooms of his family he possessed a hammer of solid gold, "to commemorate the triumph of integrity, March 21st, 1842," presented to his uncle, the late Mr. P. Verrall, which was exchanged for the customary hammer whenever the bidding rose above four figures! But though intimately associated with the Turf in all its branches, he has told the writer of this notice that he never made a bet on a horse. He was, indeed, as fearless a critic of the methods of some so-called "sportsmen" as he was the enemy of all that suggested a mean and sordid approach to the greater questions of life; nor was his outspoken criticism ever levelled at those who did not deserve it. So it happened that, when at length he was persuaded to enter the lists as a Parliamentary candidate, he was as popular with his opponents as with his supporters. Mr. Verrall's tenure of the East Cambridgeshire seat, which he wrested from Sir Charles Rose on January 24th, 1910, was not destined to be long maintained, however; and, after but nine months of Parliamentary life, the former occupant was reinstated. No doubt the great strain of two winter elections in a single year was the beginning of the end for him. A short time since he had announced his decision

to retire from the political arena; and though he took several weeks' holiday on the South Coast this spring in search of health, those of us who saw him when he returned were profoundly impressed with his changed appearance. But nothing could affect his genial temperament, or his interest in business and social engagements.

As entomologists it is not our province to dwell upon the professional and political aspects of Mr. Verrall's career. When only eighteen years of age he joined the Entomological Society of London, by whom his services as sometime Secretary were widely appreciated; and we who are also members recall that to his election in 1887 was largely due the reorganization—I may say, perhaps, the resuscitation—of the Entomological Club, of which, with the exception of Dr. B. T. Lowne, no longer an active member, he was at the time of his death the *doyen*.

Mr. Verrall was elected a member of the Entomological Society in 1866; it then consisted of only two hundred and seven members, and, when thirty-two years later he succeeded Mr. Roland Trimen in the Presidential Chair, he could say that but thirty-four had survived him. My own term of service as one of the Honorary Secretaries commenced in 1900, his second year of office; but unless I had happened to attend the famous "Annual" of the Entomological Club under his chairmanship in January, 1900, I am quite certain I should never have offered myself as a candidate for this post. So cordial and so encouraging was Mr. Verrall, however, when the suggestion was made by one or two of his guests that I did not hesitate for a moment: and I may add I owe to him, in great measure, the eleven most agreeable years of my entomological life.

But I introduce this personal experience merely as an instance of the unvarying kindness which inspired his smallest actions. His great idea in these Entomological Club suppers of his was to bring together entomologists of all ages—the students of all Orders, scientific as well as unscientific. Every year I used to receive a letter from him asking for the names of new Fellows who had joined our ranks and others likely to do so, and in what proved to be his farewell speech to the Club last January, when the disappointment of a political reverse was heavy upon him, he was consoled obviously by the reflection that the number of his guests exceeded that of any similar occasion. Indeed, there could not have been far short of a hundred present. His custom of making the supper-table the occasion for a review of current social events in the entomological world added a pleasant zest to the proceedings.

More than once in the recent history of the Entomological Society there might have been something worse than a teacup storm had not Verrall, speaking openly and frankly, poured oil on the troubled waters! He always spoke his mind, and

whether in his business, on the political platform, or in friendly discussion from the Chair, his remarks were distinguished by scrupulous honesty of purpose, and his commonsense advice and counsel were, therefore, the more gratefully received and acknowledged. Moreover Verrall, though by length of service a veteran in the field, kept pace with the modern developments of science which eventually brought entomology into the recognized forefront of the battle for knowledge. His heart was one with the "Young Guard"; in an entomological, as well as in a general, sense he never grew old, and no more remarkable proof of his intellectual energy can be given than that but a few years back he undertook the onerous work of cataloguing, describing, and figuring the three thousand or so species of British Diptera in a thoroughly scientific manner. The volumes already published—v. Stratiomyidæ, &c. (1909), and viii. Syrphidæ, &c. (1901)—are an earnest of what this great work was intended to be, and in no department will he be more sincerely mourned and missed than among our Dipterists, some at least of whom have been encouraged to proceed upon their way in this neglected branch by his patient and sturdy example.

With the termination of the late Edward Newman's proprietorship of 'The Entomologist,' and the commencement of our present Editor's term of office one-and-twenty years ago, Mr. Verrall's name appears in the list of specialists invited to join the Reference Committee; and on many occasions since he has given us the benefit of his wide knowledge.

Perhaps, however, the greatest service rendered his brother scientists was the part he played, and the generous share he took, in saving the last of the Cambridgeshire fens from the fate which has befallen so many similar strongholds of Nature. We owe it to him, and to Mr. Walter Rothschild, indeed, that the greater part of Wicken has become "a national trust," wherein the naturalist and the botanist may pursue their investigations, and the special marshland fauna and flora may continue to flourish unchecked. So that, if Verrall is remembered in the constituency which he represented for all too short a time as Member for Newmarket, we entomologists shall always acclaim him, as we did a few years back, as the Member for Wicken!

Of the value of his achievements as a lifelong devotee to the study of Diptera I am hardly entitled to venture an opinion; but certain it is that no one possessed better qualifications than he did for the work. By virtue of his magnificent collections and complete library of reference, backed with forty years' experience in the field, he could justly claim the right to be heard and accepted as an authority of the first rank.

In the realm of science his untimely death creates a void not easily to be filled. May his memory long be kept green in the

hearts of the many naturalists to whom he was ever friend and cheerful counsellor!

He leaves a widow, to whom we offer our sincere sympathy, but no son or daughter.

His collections, subject to certain reservations in favour of the British Museum (Natural History), and library are bequeathed to his nephew and scientific helper, Mr. James E. Collin, F.E.S.

H. ROWLAND-BROWN.

FURTHER NOTES ON THE BRITISH CICADA, *CICADETTA MONTANA* (HEMIPTERA).

BY G. T. LYLE.

SINCE writing my notes on our native Cicada, now some two years ago (see Entom. xliii. 1), I have had several opportunities of improving my acquaintance with this scarce British insect and its habits.

On June 3rd, 1910, I searched the known breeding-ground most thoroughly, but could find no trace of nymph-cases, and it was not until June 20th that I was successful in finding one, and two others rewarded my search on the 27th. My first visit to the locality this year (1911) was made on June 5th, when I soon found a nymph-case, and also heard two of the bugs singing, but, unfortunately, could not locate either.

On June 11th two or three of the insects were singing at 11 a.m., and at 11.30 I was fortunate enough to see one on the wing. It was flying along, some two feet or so above the fern, with a fairly strong flight, its wings glistening in the sunlight. At first sight this insect appeared, while flying, to resemble *Libellula depressa*, although the flight was neither so strong nor so graceful as that of the dragonfly. This specimen, which I netted, turned out to be a fine female. It made no attempt whatever to escape from the net, but remained quiescent with folded wings. On this day the singing of the Cicadas was almost incessant, but it was not until the afternoon that I succeeded in locating one in a pine-tree, some twelve feet above the ground. On being dislodged, it flew with a somewhat slow, heavy flight, into a neighbouring furze bush, where in the course of a few minutes it recommenced singing. The flight of this male was neither so light nor so rapid as that of the female which I captured in the morning.

Unlike some of its foreign relatives, our Cicada can scarcely be described as a noisy insect, although its note is certainly very penetrating. I have heard its "song" described as a hum, as a buzz, and as a whistle, and to my ear it appears to partake of the nature of all three, reminding me of nothing so much as the

monotonous "whirr" of the nightjar (*Caprimulgus europæus*), pitched on a much higher and more musical note. The song swells in volume as it proceeds, and then dies gradually away, occasionally ceasing suddenly. It is not continuous, the musician taking frequent rests, which may last for several minutes. I found that I could distinctly hear the note twenty yards away, at which distance it might easily have been mistaken for a "singing in the ear."

During the next fortnight I heard Cicadas several times, and found that, with practice, I could more easily locate them, and so disproved my original idea that they possess ventriloquial powers. The males seem to prefer the lower branches of the pine-trees from which to show off their musical abilities, though on one or two occasions I found the singer in a hawthorn bush. The insects become silent before sunset, and on dull cloudy days do not appear to attempt a song.

On June 14th Messrs. Claude Morley & E. A. Elliott captured, at the same locality, a male, which was singing on a frond of bracken. In this case I think it probable that there was a newly emerged female in the immediate neighbourhood, as seems to have been generally the case when males have been noticed on the ferns. On Coronation Day, June 22nd, the weather broke up and, in spite of the fact that it soon returned to its previous torrid condition, I neither heard nor saw anything of *C. montana* afterwards.

During the past season I have found some six or eight empty nymph-cases, all of which were lying loose on the turf under the bracken, within a space of some three by two yards. Careful search was made over a much larger area, but no others were discovered. In previous years they have been much more widely distributed.

There is little doubt that the majority of recorded specimens, as well as the much larger number of insects that have been captured and sold by local professional entomologists, were taken in the neighbourhood of which I have written; but it would be absurd to suggest that there are not other breeding-grounds in the New Forest. In 1901 I captured a male near Lady Cross Lodge, some two miles away, and I am indebted to Mr. Claude Morley for calling my attention to a record of a specimen taken by Mr. W. R. Buckle on June 7th, 1886, near Rufus Stone (Entom. 1886, p. 283), which is at a distance of seven miles.

In the National Collection are thirteen British specimens of *C. montana*, particulars of which have been kindly given to me by Mr. Morley. These, I think, may possibly be of interest.

Two (male and female), New Forest (Bramwell); presented by Mrs. MacCulloch in 1856. One, "J. J. Weir," New Forest, 1879; Douglas Coll. in coll. Mason, bought in 1904. One, New

Forest, 1880, Douglas Coll. in coll. Mason, bought in 1904. One (male), Lyndhurst, June 17th, 1885, Douglas Coll. in coll. Mason, bought in 1904 (in F. A. Marshall's writing). Four, ex coll. Stephens. Three "Gulliver," Lyndhurst, New Forest, June, 1892; presented by F. C. Adams in 1893. One, "G. Lewis," New Forest, June 17th, 1895, Douglas Coll., in coll. Mason, bought in 1904.

Brockenhurst: August 18th, 1911.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 308.)

(ii) *The Basses-Pyrénées. Eaux-Bonnes.*

I CAN hardly claim any particular originality in the choice of the hunting-grounds described in the first part of this paper. The coast from Biarritz to St. Jean de Luz is by no means "unexplored." On the contrary, many British collectors on the way to Spain, or returning from the Central Pyrenees, have visited this region, and given us the benefit of their experiences. The reason I selected Guéthary was the reputed abundance of *Cænonympha ædipus* in that locality, and if Guéthary failed us, then there was Biarritz only a little way off, where I had overtaken the rear-guard of the species in August, 1905 (Entom. vol. xxxviii. p. 273), and three weeks earlier in the field might ensure a bag of this interesting butterfly in good condition.

Our opening day, July 2nd, was not auspicious—hazy, with mist blowing in from the sea, and the not-very-distant Pyrenees cloaked with heavy cloud. There were, however, gleams of sunshine at intervals, but neither then, nor at any time, were butterflies on the wing. I attributed their absence, of course, to the weather; but in the event the only conclusion possible was that Guéthary as a hunting-ground was a failure. Both on this day and the 4th, when the sun shone brilliantly, we quartered the country inland for miles over what suggested an ideal ground for our purpose—marshy heath and rough pasture, with occasional scrubby oak-woods. But *C. ædipus* was nowhere to be found, only the commonest species; my own captures being limited on these two occasions to two very fine *Lampides boeticus* (females), the largest I ever saw, a few fresh *Brenthis dia*, and one fine *Colias edusa* ab. *pallida*; though Mr. Warren took several more of the latter in the rough fields near the cliffs. The only really plentiful butterfly in evidence on the heaths was *Rusticus argus*, L. (*ægon*)—all males; while a battered female

Limenitis camilla furnished a few eggs, which were successfully hatched, and the larvæ bred for the second seasonal emergence in England by Mr. Warren. In a deep shady lane at one place the males of *L. sibylla* were also in force disputing the bramble blossom with hosts of *Epinephile jurtina*; occasional examples also of *Everes argiades* (*amyntas*) were picked up from the tall grasses.

Guéthary proving hopeless, we made two expeditions to Biarritz, but the first day, July 3rd, was again dull and hazy, and we only discovered really good ground after lunch on the second day, July 5th, which reminds me that practically all that was taken on the 3rd was our *déjeuner*, which I had hidden, as I thought, in perfect safety among the fern beneath a bush. Some keen-nosed native appropriated the *poulet* and eggs, leaving us but a modest ration of bread and cheese, though fortunately I had a few pieces of chocolate in my pocket. All this took place on the ground which I had found so rich in butterflies on my former visit. But on this occasion, as at Guéthary—and it could not have been due to a retarded season, for the conditions in South-west France had been quite normal—insects were conspicuous only by their absence. A fine fresh brood of *Strymon ilicis* haunted the low, broken-down hedges, and *E. argiades* again was fairly common. *R. argus* (males) abounded, but nothing else, save for “skippers,” one or two *Thymelicus actæon*, *Argiades sylvanus*, a single *Hesperia sao*, and a single, much-wanted *H. malvoides*, Elw. & Edw. (= *fritillum*, Rbr.).*

Superficially, *malvoides* differs from the *malvæ* of the Basses-Pyrénées by the much enlarged white spots. But this local difference apparently is not constant in the Alps; and it is by close examination of the appendages alone that the fact has been established that the spring *malvæ* and the summer (*fritillum*) *malvoides* are entirely different species, as Rambur—that master of correct entomological diagnosis—long since suggested. In the field, however, there should be no difficulty in distinguishing these two *Dromios*! *Malvæ*, as with us, is an early spring species, is single-brooded, and over before *malvoides* puts in an appearance. Thus it is only when we look

* In the ‘Bulletin de la Soc. Lépid. de Genève’ (vol. ii. fasc. 2, Aug. 1911), as the result of full and patient investigation, Dr. J. L. Reverdin distinguishes in masterly style the Hesperids known to collectors as *fritillum*, Rbr., *fritillum*, Hb., and *malvoides*, Elwes & Edwards. “No doubt remains,” he says, “as to the identity of *fritillum*, Rbr., and *malvoides*, Elw. & Edw., and if the name of *fritillum*, Rbr., should be replaced as preoccupied, what better denomination can be bestowed upon it than that of *malvoides*? Have I not shown that the so-called *fritillum*, Rbr., is so analogous to *malvæ* that I could discover no constant distinguishing character? Indeed, it resembles *malvæ* as closely as it is possible so to do, and the appellation of *malvoides* acknowledges this resemblance in the happiest manner.”

over our series in the cabinet and have omitted to affix date-labels that the puzzle is disconcerting.

Our second visit to Biarritz was rather more productive in numbers, and the lower marsh country nearer the station at the far end of Lac Mouriscot was a decided improvement on the locality chosen earlier in the day. Hereabouts I took a single perfect male *Heteropterus morpheus* (evidently only just emerging), a few *Lampides bœticus*, and *Everes argiades* females; and on the upper road the sand-banked hedges hung with ivy and clematis afforded covert for an extremely yellow-fulvous form of *Pararge egeria*.

On the 6th, not without reluctance on my part—for the weather was now settled and fine, and the sea-bathing, from my bedroom at the extremely comfortable, clean, and well-managed Hotel de la Plage, excellent—we set out in the early morning for Eaux-Bonnes, travelling by Pau and Laruns, with a short drive at the end of the journey to this once favourite watering-place. I say *once*, for there is an indescribable atmosphere of yesterday about Eaux-Bonnes. The town is almost entirely composed of hotels, pensions, and lodging-houses for the benefit of guests who never come apparently, and it remained empty all the time we were there; despite the list of “worthies” who have patronized the waters, including Mr. Joë Chamberlain (*sic*). Otherwise, that list is chiefly made up of Second Empire social celebrities drawn thither when the Emperor was doing his best to popularize and make fashionable the beauty-spots of the Pyrenees.

“Too low a level” was our immediate verdict after examining the entomological possibilities of the place; while the beech-woods densely clothing the narrow ravine, into which Eaux-Bonnes is squeezed, confirmed our first impressions that we should have to climb at least 1500 ft. above the town to find the desired hunting-grounds.

Consulting the map on our journey, I had come to the conclusion that the high ridge between Eaux-Bonnes and Eaux-Chaudes promised the best results among the alpine butterflies, as afterwards proved to be the case when we climbed up to the Col de Lurdé (6400 ft.), or the valley immediately beneath it facing east beneath the Pic de Goupey (7245 ft.), on July 7th, 10th, and 12th. With the exception of some mist on the 12th, all three days were exceptionally fine, and this only made the scarcity of species, as well as of specimens, the more vexatious. The first part of the walk is a steady grind up long zigzags, protected from the fierce heat by a cool forest of beech, in which, of course, we saw nothing but an occasional battered *Pararge egeria*. Emerging after about an hour into the pastures, the first butterfly was *Erebia stygne*, evidently just emerged, for we saw no females on the 7th; but, with the exception of numerous

Pyrameis atalanta, hardly anything else was flying. And here, as everywhere else at Eaux-Bonnes, there was an extraordinary dearth of "blues" and *Melitæas*, while I think the only brown fritillaries we saw in our week's stay were *Brenthis pales*—one or two on the rhododendrons at about 5500 ft.—a casual *B. dia*, and very worn *B. euphrosyne*. A few *Cupido minimus* and very occasional *Lycæna arion* almost complete the list of *Lycænidae* represented. Higher still, and immediately below the Col, we began to find butterflies more plentiful. The shaly, rather precipitous, walls on each side, covered in places with flowers and grasses, but for the most part bare, suggested *Erebia lefebvrei*, and we had already netted some rather worn *E. lappona* var. *sthenno* at the entrance to the ravine. The sunny side soon yielded the rarer *Erebia*, and we spent the rest of the morning balancing ourselves as best we might on the slippery slopes of moving stones which are so dear to this warmth-loving species. But the moment the sun was hidden by a cloud, they disappeared like magic. My Eaux-Bonnes *lefebvrei*, contrasted with those from Gavarnie, run rather larger as a whole, while I can detect none in which the chestnut antemarginal band, so pronounced in many of the Gavarnie examples, is at all developed. But *lefebvrei* is one of the most variable of insects, and I have not enough material before me to determine whether the obsolescence of the antemarginal band is a constant feature of the more western examples. Among the rhododendrons also we netted a few *E. epiphron* var. *cassiope*, Mr. Warren securing a female with white ocellations, and several ab. *nelamus*, while a single *E. tyndarus* var. *cassioides*, von Hohenw.* (*dromus*, Fabr.), was evidently the forerunner of the seasonal emergence. The only other butterflies, hereabouts, which could be called at all abundant were some very large *Gonepteryx rhamni*, but to the top of the Col, where we climbed for lunch and where there is one of the very rare mountain springs, hardly a butterfly was on the wing; so that on each subsequent visit we did not trouble to proceed further than the *lefebvrei* ground. It was here also on the rock-strewn grass that I noticed a black and white "skipper"—in our experience the only one met with in the mountains hereabouts. Unfortunately I missed several, but Mr. Warren was more successful, and bagged some half-dozen of what, to our surprise, turned out to be *Hesperia andromedæ*. This is, I believe, the first publication in England of *H. andromedæ* as a Pyrenean butterfly†; but on looking through

* 'Bulletin de la Soc. Lépid. Genève,' vol. i. p. 215.

† This statement requires some qualification. Since I wrote it I find that I had overlooked a passage in Dr. J. N. Keynes's account of "Butterflies in the Pyrenees in 1909" ('Ent. Record,' vol. xxii. 1910, p. 109). He says that, collecting with Mr. G. L. Keynes at Gavarnie on July 9th, "we were fortunate to take two specimens of what we believe to be *Hesperia andromedæ*. . . . We do not remember seeing any previous record of this

M. Oberthür's 'Lépid. Comparée,' fasc. iv. pp. 397-8, I find the following interesting announcement: "Mrs. de la Bâtie [Beche] Nicholl has written me that she found *Syricthus andromedæ* in the Hautes-Pyrénées. For myself, I have seen no Pyrenean examples. I have taken the species in the Bernese Oberland at the end of June, 1898; but I do not believe, all the same, that it has been met with up to now in the French Alps authentically. It does not follow, however, by any means that *S. andromedæ* could not be a Pyrenean species, as Mrs. Nicholl appears to be convinced it is."*

Later on, when I had the good fortune to meet M. Charles Oberthür at Gavarnie, I was able to show him the small series of Mr. Warren's Pyrenean *andromedæ*, and I understand that a pair are to be figured in the 'Études' of some future date, with my note relative to the circumstances of capture. Mrs. Nicholl tells me that her examples were secured some fourteen years since near the Lac Vert (6430 ft.), which is in the Hautes-Pyrénées, and about four hours up from Luchon, very close to the Spanish frontier: therefore considerably east of Eaux-Bonnes, and suggesting that the range of *andromedæ* in these mountains is wide, even if it does not occur throughout the entire chain at sufficient altitudes.

Had I read the Baron de Selys Longchamps's note on the Rhopalocera of Eaux-Bonnes fifty years ago, before I started on my exploration of the mountains there, instead of a month or so after my return, I think it extremely probable that I should have tried my luck elsewhere. His account of a three weeks' visit from June 15th to July 10th, 1857 ('Bull. Ent. Soc. France,' 1858, p. lxxii.) is not encouraging. In all that time he only encountered forty species, of which "the most remarkable were *Anthocharis simplonia*, *Carcharodus altheæ*, and *un Syricthus à déterminer*. There was but a single *Erebia* (and of course it was *E. stygne*). . . . This fact should suffice to persuade an entomologist to choose any other locality than Eaux-Bonnes as the objective of an excursion in the Pyrenees."

One wonders whether that "*Syricthus à déterminer*" was

species from the Pyrenees, and perhaps this is not surprising, considering its obscurity and apparent rarity." Dr. Keynes also informs me (*in litt.*) that neither he, nor Mr. Wheeler, feel any doubt that these two specimens are genuine *andromedæ*; a species with which they are well acquainted elsewhere.

* I find among the extra-Swiss localities for the species in Mr. Wheeler's 'Butterflies of Switzerland,' p. 6, under *H. andromedæ*, "Allos, July 15th-18th, 1899 (Powell)"; and I think this record must have escaped M. Oberthür, as Mr. Harold Powell, F.E.S. is an authority we can all trust and follow with perfect confidence. Millièr's "La Turbie, May," is a most unlikely record. La Turbie is only 1594 ft. above Monte Carlo and the sea-level; and Millièr seems to have had a bad eye for the identification of "macros"!

ever identified, and whether after all it may not have been *andromedæ*! I can find no record of the Baron having pushed his enquiries further. Probably, like the majority of collectors, having read half-a-dozen descriptions of "skippers" which "might be it"! and pored over as many imperfectly executed coloured plates, he gave it up as a bad job. At Biarritz, a month later, I observe, he had further accumulated "*deux ou trois espèces à étudier*." From the remark about *Erebias*, however, I am inclined to think he never got higher than the grass interval between the beech-woods and the upper zone, where certainly we found more than his single *bête noire*—*stygne*. Unless, therefore, we had ascended far up under and on to the Col de Lurdé, I do not suppose we should ever have seen *andromedæ* in the Pyrenees. Mr. Wheeler does not suggest a zone limit for the species in Switzerland; the one or two examples in my collection I took high above Berisal, under the Wasenhorn, at not less than 6500 ft.; and above Franzenshöhe, on the Stelvio, which would be 7000 ft. at the lowest. Frey says that in the Austrian Alps it occurs at 4000 ft., but this must be exceptional, if authentic.

On July 8th we explored the Val de la Sourde, the valley reaching far up into the mountains directly south-east. Heavy rain had fallen in the night, the air was still and oppressive, and in the rare forest-clearings only an occasional *Leptosia sinapis* fluttered languidly. About noon, however, we had come to a very steep piece of rock on the opposite side of a snow-strewn valley under the Pic de Ger, having caught absolutely nothing; and here but a few worn *Erebia lappona*, and the sight of a distant herd of *issard*—the Pyrenean chamois—rewarded our labour. While soon after the rain came rushing down, and we were forced to spend an hour or so in a shepherd's hut—the only place in the whole day's excursion where drinkable water was procurable. On the 9th, Mr. Warren spent the morning, which was again very sultry, in some meadows below the town. A few *Anthocera brizæ* fell to his net, but no captures of any note. On the 11th, after a long walk under a tropical sun we arrived at the Col d'Aubisque (5610 ft.), on the route to Argeles, only to be baffled once again by a cold wind-driven mist at the summit. I think, however, that we did not miss much in this quarter, as the grass and mountain-sides were grazed close by innumerable flocks, and even where the sun was shining lower down, the lack of insect-life was due, I think, to the poverty of the vegetation rather than to climatic drawbacks.

The subjoined list is made up chiefly, therefore, of butterflies taken or observed in the neighbourhood of the Col de Lurdé, for though we overhauled the maps, and reconnoitred in all directions, we could find no better, indeed no other, ground

which offered so fair a chance of increasing our knowledge of the western Pyrenean Rhopalocera.

Eaux-Bonnes, July 6th–12th.—*Hesperia andromedæ*; *Thymelicus lineola*; *Lycæna arion*; *Cupido minimus*; *Nomiades semiargus*, *Polyommatus corydon*, *P. hylas*, *P. icarus*; *Rusticus argus*; *Strymon ilicis*; *Papilio machaon*, one or two flying round flowery slopes leading up from the Plateau d'Anouilles; *Pieris rapæ*; *Anthocharis simplonia*, an odd example or two, very worn, under the Col de Lurdé; *Leptosia sinapis*; *Colias edusa*; *Gonepteryx rhamni*, all examples met with of large size in both sexes, not uncommon; *Issoria lathonia*; *Brenthis euphrosyne*, *B. dia*, *B. pales*, a fine bright form just coming out in the rhododendron region; *Melitæa parthenie*, very dark (one example); *Pyrameis cardui*, *P. atalanta*; *Aglais urticæ*, *Eugonia polychloros*, outskirts of town; *Pararge mæra*, var. *adrasta*, *P. hiera*, very worn, one example under Col de Lurdé; *P. egeria*, common in the beech-woods; *Cænonympha pamphilus*; *Erebia epiphron*, var. *cassiope*, and ab. *nelamus*, on rhododendrons, just emerging; *E. stygne*, common generally above 4000 ft.; *E. evias*, one or two rather higher up than *stygne*; *E. lefebrei*; *E. tyndarus*, var. *cassioides*, just coming out; *E. lappona*, var. *sthenno*, all examples, as in the central Pyrenees generally, referable to this variety; *Melanargia galatea*, below the town. Thirty-six species in all.

I may add that on the Col de Lurdé I encountered also, for the first time, the dark little *Hepialus alticola*, Obth., which is about the size of *H. lupulina*, but of a dusky black upon a somewhat yellowish black ground-colour. At rest on a grass bent, it bore a striking resemblance to *Nisoniades tages*, and it was this, no doubt, which attracted my attention to the species. It seemed fairly common at this spot, but it was not until I was collecting under the Pic d'Astazou a week later at Gavarnie that I found it abundant, and made acquaintance with the extraordinary grub-like apterous female.

(To be continued.)

SOME BEES FROM FORMOSA.—I.

By T. D. A. COCKERELL.

THE bees discussed below are part of the great Sauter collection, now in the Berlin Museum. The collections of Mr. H. Sauter have added to our knowledge of the fauna of Formosa in so many different groups that his name is familiar to all students of Asiatic animals. The collection of bees is rich in new species, represented by long series of excellently preserved specimens, but includes neither new genera nor very peculiar representatives of known genera. The Formosan bee-fauna is closely related to

that of tropical continental Asia, but contains in the mountains a distinct palæarctic element. As Friese has remarked, there is no particular affinity with the bee-fauna of Japan; nor is there any evident Philippine element.

Ceratina unicolor, Friese, 1911.

Described from the female only. Thirteen specimens from Formosa (no special locality given) enable me to add some details.

♀. Varies greatly in size; length, 9 to 11 mm.

♂. Length, $6\frac{1}{2}$ – $8\frac{1}{2}$ mm.; resembles the female except in the usual sexual marks; face-markings pale yellow or ochreous, including clypeus except broad upper and lateral borders, a small supra-clypeal mark (often reduced to a minute dot), broad bean-shaped lateral face-marks, the greater part of labrum, and usually a small spot on each mandible; anterior femur, tibia, and basitarsus each with a yellow stripe; apical segment of abdomen broad, little produced at end, where it is truncate and subemarginate.

Anthophora urens, n. sp.

♂. Length 12–15 mm., robust, black, with the head and thorax above, and the pleura, covered with very bright fox-red hairs, mixed with black except on pleura and upper part of cheeks; front with hair mixed red and black, lower part of face with coarse black hair, under side of head with long pure white hair, under side of thorax with creamy-white hair; eyes red-brown; inner orbits parallel, gently concave above; tongue very long (fully 11 mm.); maxillary palpi long and slender, with the second joint at least as long as the third to sixth together, the following ones successively shorter, the sixth extremely small; paraglossæ about 2 mm. long, sharply pointed, not hairy; labial palpi very long, with the two apical joints extremely minute; antennæ black, the third joint apically, and the fourth joint, slightly reddish beneath; third joint a little longer than fourth and fifth combined, fourth much broader than long; scape with a large yellowish-white patch in front; clypeus rugose, feebly keeled in middle; labrum large, broader than long; face-markings creamy-white, as follows: lower margin of clypeus, a narrow median stripe, and broad anterior corners, a transverse supraclypeal band (broadly angulate in middle above), triangular lateral marks (filling space between clypeus and eye, nearly to top of clypeus), labrum (except narrow margin, and the usual basal spots), and basal half or more of mandibles; mandibles bidentate; malar space practically absent; mesothorax closely punctured; tegulæ light ferruginous; wings dusky; nervures piceous; legs black, with fulvous hair on outer side and black on inner, on hind tarsi all black except a small fulvous tuft at extreme base; a tuft of white hair at apex of hind tibiæ; spurs very large and long; middle tarsi normal; abdomen black with fine black pubescence, first segment with scattered red hair, conspicuous at sides, and forming a very narrow apical band; second with an apical band of red hair, broad and dense at sides, narrow and evane-

scent in middle; third with traces of a band at sides; apex with two widely separated short stout spines; venter black, with black hair.

♀. Looks exactly like the male; face-marks nearly the same, but scape all black, and lateral marks reduced to a stripe or band along margin of clypeus; third antennal joint slightly longer than the next three together; mandibles long and thick, strongly bent; middle tarsi with hair black, except some red on basitarsus; hind basitarsus very broad, strongly concave and shining on outer side.

Hab. Eight males and two females from Formosa (Sauter); no special locality given. A very distinct species, which may be compared with the following: *A. florea*, Sm., which differs by the ferruginous femora, and the narrow white hair-bands on abdomen; *A. proserpina*, Grib., which is more elongate, with orange face-markings; *A. insularis*, Sm., which differs at once in the coloration of the abdomen; *A. brookiæ*, Bingh., which has testaceous nervures, the clypeus with more yellow, and lighter wings. The type of *A. urens* is a male.

Cælioxys afra sauteri, n. subsp.

♀. Length, 9 mm.; like *C. afra*, Lep., but mandibles black (the apical tooth obscurely reddish); legs and end of abdomen black; anterior border of mesothorax with a median trilobed patch of white pubescence, instead of the stripe seen in *C. afra*, and there are no patches on each side of it, as there are in *afra*; axillar teeth with the outer side straight (convex in *afra*).

Hab. Taihanroku, Formosa, "11. 6. 08." (Sauter). This should possibly be regarded as a distinct species, but it is extremely close to *C. afra*. I suppose that Friese had this form before him when he recently recorded *C. afra* from Formosa. In its entirely black apex of abdomen it resembles the larger *C. emarginata*, Foerst.

Cælioxys rhinosus, n. sp.

♀. Length, 11 mm.; black, including the mandibles and legs; pubescence of the usual kind, white; at sides of face dense and very pale ochreous; on anterior part of mesothorax loose, not forming spots or patches; eyes strongly pubescent; front rugose, obtusely elevated in the middle; vertex with very large confluent punctures; cheeks densely covered with white hair; antennæ black; clypeus roughened but shining, strongly elevated in the middle to a keel, the side view nose-like, with a convex outline; lower margin of clypeus strongly nodulose; mandibles broad, with a long oblique cutting edge; mesothorax and scutellum very strongly and densely punctured, the latter without any smooth edge; scutellum very obtusely angulate, not dentate, in middle; axillar teeth short but evident; tubercles strongly keeled; tegulæ dark rufo-piceous; wings brown, hyaline basally; abdomen strongly punctured, with narrow dull white hair-bands, enlarged at sides; transverse grooves on second and third segments weak; last dorsal very long, strongly keeled. neither notched at sides nor turned up at end; last ventral long and

narrow, sharply pointed, extending nearly half a millimetre beyond last dorsal, not at all notched at sides: under side of last ventral striated.

Hab. Formosa (no special locality given). Easily known by the peculiar clypeus. The apical structures of the abdomen are entirely of the type of *C. brevis*, Ev., and *C. rufocaudata*, Sm., except that the last dorsal is much more elongate. Compared with *C. siamensis*, Ckll., the abdomen of *C. rhinosus* is much more densely punctured, and the clypeus is entirely different.

A second paper will deal with the genus *Nomia* as represented in Formosa.

NEW SPECIES OF BOARMIINÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 316.)

Hirasa flavipicta, sp. n.

♂. Fore wings brownish black, with a purplish tinge; ante-medial line represented by three yellow dots, and the postmedial line by six or seven yellow dots, the upper four more or less united; both lines followed by interrupted blackish bands; a yellow lunule at end of the cell, and a larger yellow spot on costal area before postmedial line; some yellow dots towards costa and dorsum represent the subterminal line. Hind wings brownish black with purplish tinge; medial and postmedial lines indicated by more or less connected yellow dots; a yellow spot about middle of medial line. Fringes of all the wings marked with yellow. Under side of fore wings similar to above; yellow markings of hind wings much enlarged; a black discal mark on all the wings, that on the hind wings the larger.

Expanse, 26–28 millim.

Collection number, 875.

Two male specimens from Arizan (7500 ft.), September 11th, 1906, and August 14th, 1908.

Prorhinia rantaizana, sp. n.

♂. Pale brown, inclining to whitish, powdered with darker brown. Fore wings have a conspicuous black dot at end of the cell; the ante- and postmedial lines very indistinct, faintly dotted with black; dorsal end of medial line purplish brown; subterminal line whitish, wavy, some purplish brown clouds on its inner edge. Hind wings have a purplish brown band before the black discal mark; postmedial line indistinct, dotted with black, commencing on the costa near the subterminal line, terminating on dorsum just beyond middle; subterminal line whitish, wavy, inwardly edged with purplish brown clouds. Under side whitish, finely powdered with brownish; discal spot and terminal area of fore wings purplish; discal spot and postmedial line of hind wings purplish.

♀. Rather more thickly powdered with brown; the purplish brown markings less in evidence.

Expanse, 30 millim.

Collection number, 803.

One example of each sex from Rantaizan (7500 ft.). The male captured April 16th, 1906, and the female April 24th, 1907.

Ectropis duplicata, sp. n.

♂. Pale greyish brown, freckled with darker; antemedial line of fore-wings dark brown, double, straight; postmedial line dark brown, double, indented at middle; discal mark black, linear; some dark clouds on terminal area; the transverse lines of hind wings similar to those of fore wings, but the antemedial is not double; all wings have a black mark at end of the cell. Under side pale greyish brown, markings as above, but transverse lines are not double.

Expanse, 28 millim.

Collection number, 816 a.

One male specimen, in rather poor condition, from Karapin (3000 ft.), August 1st, 1908.

Near *indistincta*, Hampson.

Alcis decrepitata, sp. n.

♂. Pale whitish grey powdered with brownish. Antemedial line of fore wings represented by a black dot on the costa, a smaller one on the median nervure, and a dusky mark on dorsum; postmedial line dusky, wavy, indented below costa, turned inwards under the cell, thence slightly oblique to beyond middle of dorsum; medial line or shade indicated by a blackish spot on costa above the black discoidal spot, and a blackish mark about middle of dorsum; subterminal line dusky, wavy, rather broad. Hind wings have a blackish discoidal mark, and traces of a dusky antemedial line; postmedial and subterminal lines dusky, both wavy and parallel with termen, the latter line rather broad; discoidal spot blackish. Under side whitish grey, rather silky; postmedial line and discoidal spot fairly distinct.

Expanse, 58 millim.

Collection number, 195 a.

A slightly abraded male specimen from Kanshirei (1000 ft.), April 29th, 1908.

Allied to *B. cineracea*, Moore, from Sikkim.

Alcis divisaria, sp. n.

♂. Fore wings whitish, suffused with pale pinkish brown on basal and outer areas; antemedial line black, curved, obtusely angled above dorsum, thickened towards costa; postmedial line black, dentate, strongly angled and thickened opposite end of cell, thence incurved to dorsum, above which it is slightly angled; terminal line black, wavy; discoidal mark blackish, inconspicuous; medial area, limited by transverse lines, freckled with brownish. Hind wing

whitish, freckled and clouded with brownish on basal half, suffused with pinkish brown on outer half; medial line black, undulated, thickened towards dorsum; terminal line black, wavy; discoidal dot black. Under side whitish, freckled and clouded with brownish; markings as above, but less distinct, especially on the fore wings.

Expanse, 47 mm.

Collection number, 1571.

One male specimen from Arizan (7500 ft.), August 15th, 1908.

Alcis rimosaria, sp. n.

♂. Fore wings pale ochreous brown, freckled with dark grey, clouded with blackish on the outer area; antemedial line blackish, angled below costa, indistinct; postmedial line black, dentate, nearly straight; medial line dusky, indented above and below the black discoidal spot; space between medial and postmedial lines white flecked with brown; a whitish cloud at apex and another below middle of outer area; fringes checkered with dark grey, preceded by a series of black lunules. Hind wings whitish, flecked with ochreous brown and dark grey; discoidal spot and diffuse line below it blackish; postmedial line blackish, dentate, followed by a blackish shade towards dorsum; fringes whitish grey, preceded by a series of black lunules. Under side similar to above, but paler; postmedial line of hind wings indicated by dots, except towards dorsum.

Expanse, 38 millim.

Collection number, 806 a.

A male specimen from Arizan (7500 ft.), September 15th, 1906.

Alcis amplaria, sp. n.

♀. Greyish brown, suffused and clouded with blackish; antemedial line of fore wings black, curved, indented below costa; postmedial line black, dentate, inwardly oblique between veins 5-2, thence sinuous to dorsum, where it is thickened; discoidal mark black, linear, followed by a blackish shade-like band terminating on dorsum near the postmedial; subterminal line whitish, inwardly edged with black, indistinct towards costa. The black transverse markings on the hind wings appear to be continuations of those on the fore wings, but the postmedial is curved and more strongly dentate, and the subterminal is rather broader and inwardly shaded with blackish. Under side pale grey, rather silky; a square white spot at apex of fore wings; all the wings have a black discoidal spot and broad blackish postmedial line, the latter marked with black on the veins; hind wings have a whitish patch on termen towards costa.

Expanse, 58 millim.

Collection number, 1542.

A female specimen from Kanshirei, April 30th, 1908.

Closely resembles *A. gemmaria* from Europe, but much larger.

FOUR NEW PTEROPHORIDÆ.

BY T. BAINBRIGGE FLETCHER, R.N., F.E.S., F.Z.S.

(Published with the Sanction of the Inspector-General of Agriculture in India.)

(Continued from p. 283.)

Oxyptilus wallacei, n. s.

♀ ? . Exp. 15 mm. Palpi upturned, long, thin, acuminate, sickle-shaped, projecting length of head beyond it, second joint much longer than diameter of eye, third slightly shorter than second; dark reddish-brown, whitish at joints and beneath. Antennæ dark ferruginous, spotted with white. Head dark ferruginous; a few erect scales on back of vertex. Thorax ferruginous-yellow, black anteriorly and posteriorly. Abdomen long, stout, bright golden orange; some whitish-ochreous suffusion on sides at base, third segment with a transverse apical black bar across dorsal area, sixth segment blackish apically, seventh and succeeding segments blackish; a pair of long, narrow, parallel ochreous-brown anal hair-pencils. Legs bright golden orange; posterior tibia slightly dilated, with short blackish spines at one-half and apex, and emitting pairs of long blackish spurs, of which the inner are the longer; posterior tarsi lined above with black, except in middle of first tarsal joint. Fore wing rather broad, cleft from beyond two-thirds (within three-quarters), both segments slightly dilated posteriorly; first segment subparallel-sided, both angles well-marked, termen slightly oblique; second segment as broad basally as first, slightly dilated posteriorly, tornus well-marked, termen oblique, concave, anterior angle rather produced. Colour black; costa dotted with white on its middle third; patches of bright ferruginous-orange as follows: (i) a few small ill-defined basal patches; (ii) an elongate discal patch between about one-fourth and one-half, enclosing a small black spot, not reaching costa, and only reaching dorsum at base of patch; (iii) an inwardly oblique bar from costa at three-fourths, extending over basal half of first segment, around base of cleft, and into basal half of second segment, becoming obsolete towards dorsum; first segment crossed at two-thirds of its length by a narrow white inwardly oblique line parallel to termen, and with a few white dots on hinder margin on basal half of segment; second segment cut beyond one-half of its length by a narrow white inwardly oblique line. Cilia on costa black, except opposite outer orange patch and transverse line, where they are ochreous-whitish, on termen of first segment whitish, black around both angles, within cleft whitish on basal three-fifths, black on terminal two-fifths of segments, on termen of second segment whitish, black at base, very narrowly so in centre of termen, broadly so around angles, on dorsum whitish, with small black scale-teeth at beyond one-half, about two-thirds (rather within a line drawn from base of cleft), and five-sixths (exactly below transverse white line), blackish, and gradually decreasing in length between last scale-tooth and tornus. Hind wing cleft from about two-fifths and from near base, segments linear, third segment about one-half length of first; bright golden orange, first two segments blackish beyond one-fourth.

Cilia yellowish-grey, blackish-fuscous on outer half of first two segments; third segment with a small apical scale-tooth, composed of black scales, short and of uniform length on fore margin, longer basally on dorsum, and decreasing in length to tornus.

One specimen. ARU (Wallace), *ex* Stainton Collection.

In the general appearance of its fore wings this species appears to be a *Platyptilia*, but the long sickle-shaped palpi, ornamented abdomen, and linear-segmented hind wing, with a scale-tooth on fore margin of third segment, seem to bring it within the genus *Oxyptilus* as at present understood. There is no doubt that, in the near future, this and other species will have to be removed from the genus *Oxyptilus*, but until further material for study is accumulated it seems to me that no good purpose will be served in attempting to differentiate new genera.

O. wallacei will probably form the type of a new genus, which (though I cannot examine the neuration) will be somewhere intermediate between *Oxyptilus* and *Sochchora*.

Sochchora albipunctella, n. s.

♂. Exp. 15 mm. Labial palpi long, very slender, erect, smoothly scaled; second joint curved, ferruginous-brown; third joint acuminate, about two-thirds length of second, ferruginous-brown, paler at base; third joint equals diameter of eye. Antennæ ciliated, blackish-ferruginous, dotted with whitish above. Head bright ferruginous; top of crown with some erected scales. Thorax bright ferruginous, ferruginous-golden on patagia and posteriorly. Abdomen large and stout; bright ferruginous-golden, dorsal region mixed with whitish anteriorly, posteriorly ferruginous; anal tuft dark ferruginous; venter whitish. Fore leg ferruginous-golden, tibia dilated with scales at apex, last two tarsal joints blackish. Mid leg ferruginous-golden, tibia with apical tuft emitting a pair of long spurs; tarsal joints whitish, last two blackish. Hind legs broken. Fore wing rather broad, cleft from within three-fourths, segments broad, apex slightly flaccate, termen on first segment concave, on second undulate; bright ferruginous-brown; base indistinctly marked with yellowish, an ochreous dorsal dot at one-fourth, an ochreous subcostal elongate spot at one-fourth, followed by an ochreous subcostal longitudinal streak, a transverse black streak opposite base of cleft at two-thirds, preceded and followed by pale ochreous suffusion continued obliquely downwards to dorsum, where it becomes whitish; first segment with an inwardly-curved whitish-ochreous line near base from costa to near hinder margin, area between this line and discal black streak irregularly suffused with pale ochreous, at two-thirds length of first segment a transverse incurved whitish-ochreous line; second segment cut at two-thirds by an inwardly-oblique whitish-ochreous line interrupted in centre. Cilia on costa blackish, with four short whitish-ochreous streaks on first segment, at apex blackish; on termen whitish-grey, black at base; within cleft whitish-grey; on dorsum whitish-grey, with slight blackish wisp at three-fifths, a narrow black wisp at four-fifths, area beyond this tinged with ochreous. Hind

wing cleft from about three-fifths and one-fourth; first segment narrowly expanded posteriorly, sharply cut off terminally; second segment short, with distinct tornal angle, termen oblique, subconcave; third segment linear; pale ferruginous, first two segments blackish beyond two-thirds of wing, first segment conspicuously pure white on outer third of segment, third segment irrorated with blackish on outer third of its length. Cilia on costa blackish, on termen white, within first cleft blackish, mixed with white near base of cleft, on hinder margin of second segment greyish-white, on third segment pale ferruginous; on hinder margin of second segment blackish tufts at two-thirds (length of hinder margin of segment) and hinder angle; on third segment a small blackish apical scale-tuft on both margins, and a few blackish scales on dorsum beneath base of second cleft.

Hab. EGA (Bates). Type in British Museum Collection.

Pusa, Bengal: June 17th, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

(Published by Permission of the Trustees of the British Museum.)

(Continued from p. 314.)

AT no point, perhaps, does the classification of the Coleoptera present greater difficulties than in the attempt to determine the true relationships between the various families that enter into the group Diversicornia. One of the difficulties arises no doubt from the fact that some of these families have not received their due share of attention, and that less is known about them and their life-histories than there is about many less interesting families belonging to more attractive groups. Conclusions that may be drawn from a study of the external morphology of the imagines alone are sometimes apt to be upset, or at least not completely borne out by a study of the corresponding larval forms. Certainly it is sometimes very surprising to see what great differences there are between the larvæ of certain families which otherwise would be considered to be very nearly related. And these differences are nowhere more marked than in the case of some of the families placed in the group Diversicornia. For this and for other reasons one is inclined to suspect that it is not a monophyletic group, but must have evolved from common ancestors in more than one direction, and ought therefore to be capable of being split up into two or more well-marked groups. But while admitting this, I confess to finding serious difficulties in accepting the groups proposed

either by Lameere or by Kolbe, or even the two groups Cantharoidea and Dascilloidea, under which we find the Diversicornia arranged in the last edition of the 'Catalogus Coleopterorum Europæ.'

Some of the groups, as, for example, Kolbe's Malacodermata, are no doubt natural ones in the sense that the families included are all more or less closely related to one another; but they cannot be regarded as family series in an equivalent sense to such family series as the Adephaga, Staphylinoidea, Heteromera, or Phytophaga.

Take Kolbe's group Trichodermata. In what relation does this stand to his group Malacodermata? So close a relationship do they show through the Malachiidæ, both in the larval state and as imagines, that it is hardly possible to doubt that they are derived directly from them. And this being the case, they ought surely, as Lameere maintains, to be included with them in the same family series. From a series thus constituted Lameere would exclude the Derodontidæ, whether rightly or not I am hardly prepared to say, though I certainly should not place this family between the Corynetidæ and Cleridæ. The doubtful origin and position of this family is one of the difficulties I find in regard to Lameere's own group Malacodermata. Two other families—the Byturidæ and Ostomidæ—placed by Kolbe and Lameere in the Clavicornia, offer resemblances of such a character to the Melyridæ and Cleridæ as to give some reason to doubt whether these resemblances are merely the result of convergence. And it was probably for some such reason that the authors of the European Catalogue place in the single series Cantharoidea most of the families which Kolbe places in his groups Malacodermata, Trichodermata, and Clavicornia. In this series also they place the Sphindidæ and Cioidæ, two of the families included in Kolbe's group Bostrichoidea. Lameere also places these two families amongst the Clavicorns, and but for this and his inclusion in it of the Derodontidæ, his group Teredilia would be equivalent to the Bostrichoidea of Kolbe.

If the doubtful families could be put aside, the Teredilia or Bostrichoidea left as a group consisting of the Lymexylonidæ, Lyctidæ, Bostrichidæ, Ptinidæ, and Anobiidæ, would be a fairly natural one, having no very evident affinity with any of the remaining families of Diversicornia. They are included amongst the Dascillidæ in the European Catalogue, altogether wrongly, I think, for it seems impossible to derive them from any but the most primitive of Diversicornia. It is almost certain that they cannot have been derived from any other of the families included in the Dascillidæ. Of the groups into which it has been proposed to split up the Diversicornia, there is none which has, in my opinion, a better claim to stand than this one of the Teredilia or Bostrichoidea.

Another group—the *Sternoxia* of Kolbe—would seem almost to have an equal claim to stand, but there seems to me to be much weight in Lameere's argument that the *Buprestidæ* cannot be derived from any of the other families which Kolbe includes in the group. Structurally they are very different, and there is also a vast difference between the larvæ of the *Buprestidæ* and *Elateridæ*—a wide gap which no intermediate forms fill up. Lameere believes it to be a diphyletic group, the *Elateridæ* and *Buprestidæ* being derived from different *Dascillid* ancestors. In consequence he places the *Sternoxia* and *Dascillidæ** all in one family series, for which he retains the name *Sternoxia*. Kolbe, too, admits that the *Sternoxia* are derived from *Dascillidæ*, but from the non-development of coxal plates on the hind legs of the *Cerophytidæ* he argues that the *Sternoxia* could only be derived from some *Dascillid* ancestor in which these plates were absent—a condition met with in no existing family of the group. There would be little to distinguish that *Dascillid* ancestor from a *Malacoderm*.

For other reasons I have myself been led to the opinion that the *Elateridæ* and *Cebrionidæ* are more nearly related to the *Malacoderms* than they are to the *Buprestidæ*, or even to the *Dascillidæ*, from which they are supposed to be derived. To me it would seem quite as reasonable to believe that the *Dascillidæ*, or some at least of the families included in the group, have themselves been derived from primitive *Elateroid* ancestors. The larvæ of the *Elateridæ* are in many ways so very like those of the *Malacoderms* that it is difficult to say in what essential respect they differ. The wing-venation of the more primitive genera of *Elateridæ* is scarcely distinguishable from that of the *Lampyridæ* and other *Malacoderms*, and certainly resembles it more than it does that of any *Dascillid* genus which I have yet examined. The *Elateridæ* have, like the *Malacoderms*, only four Malpighian vessels, whereas it appears that the *Dascillidæ*, as a rule, have six, though to this rule there are exceptions, which will no doubt increase when the group has been more thoroughly investigated. In the *Dascillidæ*, without exception so far as I know, the scutellum and base of the elytra are more or less raised and sharply margined in front so as to fit closely and perfectly against the base of the prothorax. This co-adaptation of the parts is wanting, or at least not nearly so perfect, in the *Cebrionidæ*, the condition in this family being more like that of the *Malacoderms*. The coxal plates for covering the hind femora are, as Kolbe points out, wanting in the *Cerophytidæ*, and are so feebly developed in some *Elateridæ* that there is little in that respect to distinguish them from the *Malacoderms*. The genus *Phenace* of Pascoe, placed by him in the *Melyridæ*, offers

* In the *Dascillidæ*, Lameere includes the *Artematopidæ*, *Dascillidæ*, *Lichadidæ*, *Rhipiceridæ*, *Chelonariidæ*, *Eucinetidæ*, and *Cyphonidæ*.

characters of such a kind that it is difficult to decide whether it is a Malacoderm or an Elaterid. The head has in front a rather sharp, slightly raised, projecting margin, beneath which what appears to be a narrow transverse epistome can just be seen; the prosternum sends back a short narrow process which is received in a small cavity or depression of the mesosternum. Both of these characters suggest an affinity with the Elateridæ, and there is nothing to conflict with this view either in the structure of the legs, including their long, simple, five-jointed tarsi, or in the shape and sculpture of the elytra, all of which have much resemblance to those of *Ceroplastus*.* But the prothorax, instead of having the posteriorly diverging sides and conspicuous hind angles so characteristic of the Elateridæ, has the sides slightly rounded in the middle, narrowed as much towards the base as to the apex, and with only a feeble trace of a sharp lateral margin. Again, there is no such co-adaptation between the base of the prothorax and the base of the elytra and scutellum as is generally met with in the Elateridæ. But this, as I have already stated, is very imperfect in the Cebrioidæ, and it is almost equally so in *Ceroplastus*. On the whole, it is most probable that *Phenace*, Pasc., is a Malacoderm, though not rightly placed in the Melyridæ. But if a Malacoderm, it seems to me to be one that with very little change might be converted into an Elaterid of a not very primitive type. By saying that I do not wish to suggest that it is a prototype of the Elateridæ. It is only to support my view that the relationship between the Elateridæ and Malacodermata is very much closer than has hitherto been suspected.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By FRED V. THEOBALD, M.A., F.E.S., &c.

THE following eighty-three species of Aphididæ from Kent have been definitely identified. Most of them have been taken this year. Many are new to Britain. Some dozen or so more I have been unable to fix with any degree of certainty, and at

* *Ceroplastus*, Heyden, 1891, for some time wrongly named *Plastocerus*, is one of a group of genera, taken some from the Elateridæ and some from the Eucnemidæ, to form a family, named by Reitter Phylloceridæ, and by Schwartz Plastoceridæ. From this proposed family, as it was characterised and constituted by Schwartz, there are certain genera which ought to be excluded, and, as one of these is the genus *Plastocerus* itself, the family name can hardly stand. Reitter gives as the chief distinguishing character of the family that there is a membranous hind border to each of the first four visible segments of the abdomen, whereas in true Elateridæ and Eucnemidæ only one segment, the fourth, is so provided. But the possession of this one feature in common does not seem to be a sufficient justification for bringing together forms which otherwise are so different as *Phyllocerus* and *Ceroplastus*.

least ten marked species are new. The latter will be described later. They have nearly all been taken within a three-mile radius of Wye. This makes one hundred and sixty-four species known to the Kent fauna. A few localities outside Kent are also given. The old descriptions in several cases are quite inadequate; for instance, the descriptions of *Macrosiphum* (*Siphonophora*) *pisi* of Kaltenbach, Koch, Buckton, and others, applies equally well to the green aphid on stitchwort (*Stellaria*), on meadow-sweet (*Spiræa*), &c., but a microscopic examination shows them to be distinct species. Species, especially in the genus *Macrosiphum*, can only be identified from balsam preparations. The structure of the antennæ and the sculpturing of the cornicles, and to some extent the female genital process, are the characters of most specific value. The number and disposition of the "sensoria" on the antennæ in the alate forms is very marked in the different species, as well as the form of the segments.

In many cases I find it most difficult to place species in the described genera, and several recorded here I have left in the old genus *Aphis* pro tem. The present year has been one of the most prolific we have seen for plant-lice for a long time, but the prolonged drought destroyed so much of the vegetation they were found on that in many cases no alate forms occurred.

Genus *MACROSIPHUM*, Passerini (*SIPHONOPHORA*, Koch).

Macrosiphum (*Siphonophora*) *gei*, Koch.—Abundant in all stages on *Geum urbanum*, clustering on the flower-stalks, colonies often six inches long. The alate forms readily fall if shaken. Wye, Faversham, and Herne Bay, from the first week in May until August; constant winged broods appearing. Passerini places this as a synonym of *pisi*, Kaltenbach; it is quite distinct. I also found it in May at Ventnor, Isle of Wight, and in Ecclesbourne Glen, Hastings. No trace after August 10th. Schouteden considers this the same as *ulmaria*, Sch.

M. (S.) stellaria, Schrank.—Abundant on the lesser stitchwort (*Stellaria graminea*) in May. Like the former, readily falls if shaken. Mostly large apterous females. Wye, May 27th, 1911, fairly common in one locality; also found abundantly on May 7th, in Ecclesbourne Glen. Kaltenbach mentions *Aphis pisi* on this plant, evidently mistaking it for his species described from peas, &c.

M. (S.) ulmaria, Schrank.—On meadow-sweet (*Spiræa ulmaria*), in dense colonies on the young shoots, and later under the flower-heads. The adults readily fall if shaken. Alate and apterous forms in June and July. Very common, Wye, 1911.

M. (S.) jaceæ Linn.—On thistles, Wye Down, June 30th, July 11th, and October 10th, 1911, apterous females and larvæ in a dense mass beneath blossoms and down the stalks; on *Centaurea nigra*, July 11th, August 19th, and October 15th, 1911, winged and wingless females, and a few on *Centaurea cyanus*.

M. scabiosa, Buckton.—On flower-stalks of wild and cultivated scabious. Common around Wye, June 15th and July 11th, 1911; also on *Capsella bursa-pastoris* seedheads, June 12th, 1911.

M. (S.) artemisiæ, Boyer.—On *Tanacetum vulgare* at Crundale, June 27th, 1911, and on the same from Hereford, July 24th, 1911; a few apterous females. Kaltenbach's *tanacetaria* is evidently the same.

M. (S.) absinthii, Linn.—On wormwood; Wye, July 20th, 1911, a few apterous females on a single plant growing on the Agricultural College Farm; Hereford, a number sent me by Dr. Durham, July 24th, 1911.

M. (S.) alliarie, Koch.—A few large apterous females on thistles near the river Stour, Wye, June 7th, 1911; also on sow-thistles (*Sonchus*) and small hawkweed (*Hieracium* sp.?), a few wingless females and larvæ on each flower-head, some pink; also on *Crepis*, August 7th, all larvæ and apterous females.

M. (S.) centaureæ, Koch.—On wild knapweed (*Centaurea nigra*) on Wye Downs, in lines of ten to fifty up the flower-stalks, June 20th and July 17th, 1911.

M. (S.) tussilaginis, Koch.—On the under side of young leaves of coltsfoot (*Tussilago farfara*) at Herne Bay, July 15th, 1911, two apterous females, in company with two other aphides apparently undescribed.

M. (S.) cichonii, Koch.—Below flowers and buds of *Cichorium intybus*, Wye, July, 1911, winged viviparous females, scarce.

M. (S.) hieracii, Kaltenbach.—On a garden hawkweed, Wye Court, June 12th, 1911, in great abundance; no winged forms appeared, a few on the flower-stalks of *Hieracium umbellatum* on Wye Downs, June 20th, 1911. Has continued through until October 15th without any winged forms appearing.

M. (S.) campanule, Kaltenbach.—On *Campanula rotundifolia* in small numbers on the Warren, near Ashford, taken by Mr. Jemmett in July, on the flower-stalks.

M. (S.) ribicola, Kaltenbach.—On gooseberries, distorting the tender shoots in May around Wye. Caused considerable harm and must not be confused with several other gooseberry species.

M. (S.) olivata, Buckton.—On *Carduus lanceolatus*, apterous females only, Wye, July 2nd, 1911; and also from Haddenham, Cambridgeshire, June 19th, 1911.

M. (S.) lathyri, Walker?—On *Lotus corniculatus* and *Lathyrus* sp., Wye, August 3rd, 1911. Closely resembles *M. pisi*, Kaltenbach, but quite distinct, wingless females only in small numbers.

M. (S.) convolvuli, Kaltenbach.—On the large wild bindweed (*Convolvulus major*). A single apterous female at Wye, under a leaf, June 20th, 1911.

Genus MEGOURA, Buckton.

Megoura (Siphonophora) viciæ, Kaltenbach.—Wye, on broad beans in my garden with *Aphis rumicis* and *M. pisi*, June 7th, 1911. On *Vicia* and *Lathyrus*, July 4th and 10th, 1911, all wingless females; September 19th, 1911, on *L. sylvestris*, dense masses of large wingless females on the green seed pods, near Wye station. There is no doubt that Buckton's *M. viciæ* is the same as Kaltenbach's. It also answers to the same insect figured by Koch, except that in the figure the legs are all black and the wingless female has two black spots at the base of the cornicles. Buckton, however, says his *Megoura viciæ* is certainly neither Kaltenbach's nor Koch's species. This genus

seems so close to Buckton's *Amphorophora* that it should probably be sunk as a synonym of it.

Genus PHORODON, Passerini.

Phorodon galeopsidis, Kaltenbach.—A few wingless females on *Polygonum aviculare*; Wye, June and July, 1911, and a winged female on October 14th.

Genus RHOPALOSIPHUM, Koch.

Rhopalosiphum calthæ, Koch.—This marked species I found in abundance in June and July on the king-cup (*Caltha palustris*). On June 7th I first noticed a few large apterous females on the under sides of the largest leaves in a wood near the Stour at Wye. On visiting them in the following week, each female was surrounded by brownish young, as many as forty around each mother, of various sizes. These patches were always round and the insects remained close together and could not easily be removed, as they held tenaciously to the tissue. Winged females occurred on July 20th, and went on appearing until the plants under observation died. The very marked cornicles might be a sufficient character to separate this insect from the genus in which Koch placed it. In alcohol they gave a deep brown solution.

Rhopalosiphum berberidis, Kaltenbach.*—I found this species in profusion in June on a *Berberis* in my garden. They had all disappeared by August 20th. Winged and wingless females were always found together.

R. xylostei, Schrank.†—Found between Wye and Boughton on wild honeysuckle, June 6th, 1911. Evidently this species, but the cornicles are green.

Genus SIPHA, Passerini.

Sipha glyceriæ, Kaltenbach.—Two colonies of apterous females on *Poa aquatica* leaves along old river, Wye, July 20th, 1911, with another unidentified species.

Genus APHIS, Linnæus.

Aphis myosotidis, Koch.—On wild forget-me-nots, Wye, June 7th, 1911. A few winged females and larvæ fixed close in young apical growth, often hidden between young leaves and blossom buds.

A. lychnidis, Linn.—On red robin (*Lychnis diurna*) at Wye, Crundale, Herne Bay, and Faversham, in June (7th to 30th). Wingless females and larvæ on top of shoots and around flowers; no trace left on August 1st; a few in July, also at Ventnor and Hastings in May. Schouteden places this in the genus *Myzus*.

A. lantaneæ, Koch.‡—Wye, June; curling leaves on apices of shoots of *Viburnum lantana*, dense masses of wingless females and larvæ. Another species found with it, but not yet identified.

A. umbellatarum, Koch.—At Wye, Kennington, and Crundale,

* Walker placed this in the genus *Liosomaphis*, Wlk., but if the genus *Rhopalosiphum* is to stand, I see no reason to change its name.

† Kirkaldy, 1904, places *xylostei*, Schrank, under the genus *Hyadaphis*, which Schouteden has adopted.

‡ Mordwilko (1908) places this in his genus *Chaitophoroides*. It appears to me to be a typical *Aphis*.

June 3rd to 10th, and July 12th. Winged females and larvæ on various umbelliferæ. On *Enanthe crocata*, June 6th, 1911, winged and wingless females; on *Heracleum spondylium*, July 11th, 1911. Schouteden places this as a synonym of *A. pastinacæ*, Linn. The two species seem to me very distinct.

A. evonymi, Fabricius.—Wye and Broughton, on spindle (*Euonymus europæus*). Small colonies of alate forms under the leaves, producing leaf-curling, June 6th and 9th, 1911. Schouteden places this as a synonym of *A. rumicis*, Linn. It appears to me to be quite distinct.

A. abietana, Wlk.—On spruce at Wye in May and June, both on the shoots and needles. Winged females occurred in June. Common in my garden with an unidentified *Lachnus*. Also from Worksop, May 18th, 1911.

A. mahaleb, Koch.—Wye, on plums of all kinds, a few wingless females from April to May 20th, on young shoots and beneath leaves, not common; also sent me from Worcestershire; quite a distinct species, and in no way connected with *Phorodon humuli*.

A. ephilobii, Koch.—On the small willow herb (*Ephilobium parviflorum*), a few scattered wingless females in June at Wye, 1911. Winged and wingless females on *Epilobium hirsutum* on October 12th, 1911.

A. rhei, Koch?—I place this here provisionally, as I have not made a critical examination of the insects. Occurred at Wye in dense masses, bleaching the flower heads of rhubarb all through June. It bears a strong resemblance to *A. papaveris*.

A. capsellæ, Kaltenbach (non Koch).—On seed heads of shepherd's purse, Wye, June 13th, 1911. All wingless females, not common. Winged females occurred on the seed-heads in October in some numbers, and produced living young. Koch's species I have not found; it is distinct from Kaltenbach's.

A. lythri, Schrank.—On purple loosestrife (*Lythrum salicarium*) amongst the flower heads, Wye, July 5th to 20th, 1911. Apparently uncommon, all wingless females.

A. chenopodii, Schrank.—On mangolds, Herne Bay, July 12th, 1911, under the curled leaves with *A. papaveris*, Fab., *A. atriplicis*, Linn. and a new species. Schouteden places this species as a synonym of *atriplicis*, Linn. It is distinct, and produces a very different appearance of the leaves.

A. genistæ, Kaltenbach.*—The Warren, Ashford, densely coating the seed pods and flower stalks of the broom (*Cytisus scoparius*). Possibly the same as *A. laburni*.

A. laburni, Kaltenbach.—On seed pods of laburnum, Wye, June 27th, 1911; Canterbury, June 19th, 1911; Maidstone, Faversham, July 16th, 1911. Also sent me from Hereford by Mr. Durham.

A. picridis, Fabricius?—Fairly abundant in apterous form for two weeks on a garden hawkweed (*Hieracium*, sp.), and a few on wild chicory (*Chiconium intybus*), Wye, July 4th, 1911. Schouteden places Fabricius's species in *Macrosiphum*, so my specimens must belong to some other species. Although the siphons are long, they are not like a true *Macrosiphum*, and I fancy my identification is correct.

* Del Guercio, 1907, places this in his genus *Uraphis*. It seems to present no marked differences from others of the genus *Aphis*.

A. salicti, Kaltenbach.—On osiers, Wye, June 3rd, 1911. Wingless females and a few winged, partly on young wood, some on the leaves. Its generic position is not certain.

(To be continued.)

INSECTS TAKEN BY DR. T. A. CHAPMAN IN SWITZERLAND, 1911.

BY W. J. LUCAS, B.A., F.E.S.

Orthoptera.

**Anechura bipunctata* (a common earwig in the Alps); one female, Pontresina, † July.

Plecoptera. (Pontresina, July.)

**Dictyopteryx alpina*, male and female.

**Chloroperla rivulorum*, male.

**Isopteryx montana*, female.

**Tænipteryx neglecta*, female.

**Nemoura obtusa*, male and female. (It has been taken by Standfuss and Morton at Silvaplana, and by Ris at the Albula.)

Ephemeroptera. (Pontresina, July.)

Baëtis sp., a female imago.

**Ecdyurus helveticus*, a male imago.

Odonata (= Paraneuroptera).

**Somatochlora alpestris*, one male, Pontresina, July.

Æschna juncea, one male, Linththal, † end of June.

Agrion hastulatum, two males, end of July, of which Dr. Chapman says: They "were common at Statzer See (6000 ft.) by St. Moritz. I could easily have taken a dozen or two. It was the only dragonfly at all common, or easy of capture."

Neuroptera.

**Panorpa alpina*, one female, Linththal, end of June.

**P. vulgaris*, one male, Pontresina, July.

Sialis lutaria, three, Pontresina, July.

Trichoptera. (Pontresina, July.)

Phryganea obsoleta, four males.

Limnophilus rhombicus, one female.

L. flavicornis, one male (the fine alpine form, also taken by Standfuss at Silvaplana).

**Drusus chrysotus*, male and female.

**D. discolor*, female.

Stenophylax alpestris, male.

**Lithax niger*, three males.

Mystacides azurea, male and female.

Those insects whose names are preceded by an asterisk (*) do not belong to the British fauna.

† Pontresina means also St. Moritz and district around—6000–8000 ft. Linththal means that valley and upwards—4000 ft.

Kingston-on-Thames: October, 1911.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

BY W. G. SHELDON, F.E.S.

SCANDINAVIA has hitherto received but little attention from our British lepidopterists ; there are good reasons for this, for, although according to Lampa's list Sweden and Norway together hold one hundred and eight species of Rhopalocera—including a round dozen which are not found elsewhere in Europe, except in Russia, and about half as many more than can perhaps be found with certainty and easier there than elsewhere—the experience of past explorers has not been altogether successful, and I am not sanguine that anything I can say on the subject is likely to send my brethren of the net swarming thitherward.

The distances to be traversed (my journeyings involved travelling about five thousand miles) ; the comparative inaccessibility of some of the reputed best localities ; the uncertainty of the weather, which not infrequently compels one to be a week or more without the sight of a wing ; and the little knowledge that exists of the exact time at which a species is to be found in a locality, with the variation of dates of emergence in different places and seasons, are amongst the difficulties one has to contend with.

I had, in view of these and other obstacles, been making enquiries, as exhaustive as possible, during the past winter, with a view to an itinerary that offered the best chances of success with the butterflies of the region ; and I would like here to take the opportunity of returning my best thanks for the very valuable information given fully and freely by all to whom I applied ; my thanks are especially due to my friends Messrs. H. Rowland-Brown and A. H. Jones, to Herr Max Bartel of Berlin, and to Pastor Pfitzner of Sprottau (both of whom have recently visited Lapland), and to Herr Spane Schneider of Trömsö, to whose assistance is largely due any success that I achieved.

The only articles on Scandinavian Lepidoptera I can find in the English magazines are the following :—

- (1) "Notes on some Lepidoptera Captured in Norway," by R. C. R. Jordan, M.D., *Ent. Mo. Mag.* xxv. p. 139.
- (2) "Notes on the Coleoptera and Lepidoptera (Rhopalocera) of Norway," by G. C. Champion, F.Z.S., *Ent. Mo. Mag.* xxvi. p. 72.
- (3) "Butterflies in South and North Norway," by T. A. Chapman, M.D., F.E.S., *Ent. Mo. Mag.* xxxv. p. 20.
- (4) "Lepidoptera in the Neighbourhood of Roldal, Norway," by the Rev. F. A. Walker, D.D., F.E.S., '*Entomologist*,' xxv. p. 36.
- (5) "Among the Butterflies and Flowers of Norway," by R. S. Standen, F.L.S., F.E.S., '*Entomologist*,' xxxi. p. 193.

(6) "Some Notes on Scandinavian and Lapland Butterflies," by H. Rowland-Brown, M.A., F.E.S., 'Entomologist,' xxxix. p. 220.

(7) "Notes on a Small Collection of Lepidoptera made by Dr. T. A. Chapman in Lapland," by J. W. Tutt, F.E.S., Ent. Record, viii. p. 289, and observations thereon, by W. E. Nicholson, F.E.S. (*ibid.*), p. 294.

It will be noted that all these articles, except Mr. Rowland-Brown's, deal with Norway only, and possibly this was one of the reasons that decided me to confine my attention entirely to Swedish territory; there were others, however, that had their influence, among them being the difficulty experienced in Norway, that in consequence of the proximity of the Gulf Stream butterflies emerge in the Arctic Regions at practically the same dates that they do in the South; one cannot therefore with advantage collect in both these areas in one season.

In Sweden the arctic portions are much colder, and thus in this country one can occupy the first half of June with the south and then proceed by train, a two days' journey, to the north, to find the season of emergence just commencing there. Then, again, the rainfall of Sweden is much less than that of Norway, and this seemed to promise a greater chance of sunshine, and consequent better opportunities of observing and collecting, and probably greater abundance of specimens than were likely to be found in the sister country.

It is the usual experience in discussing Scandinavia with those of our acquaintance who have visited it, and who have any knowledge of Lepidoptera, to be told that the only butterflies they have seen there were the species common in all countries, such as red admirals, tortoiseshells, orange-tips, &c.; this is no doubt a fact, and it is accountable on the supposition that the relators did not search in the proper places. Nowhere in Europe, I suppose, are the special butterflies of a country more local than in Sweden, and presumably in Norway also.

Until the dawn of civilization a few hundred years ago, the whole country up to the tree limit, was covered entirely by forests of birch, spruce, and pine, and swamps; a great portion—probably three-fourths of the area or even more—is still in practically primeval condition.

These forests are usually so thick as to preclude the growth of the plants butterfly larvæ feed upon, and thus you may wander in them for hours without seeing a butterfly, or for a week without being able to net one you would care to take home.

In the swamps, which are in area but a small percentage of the entire country, the case is different; it does not seem to matter much whether a swamp is hidden away in the depths of some great forest, where a hollow has held the moisture for ages, or if it is in the slope of a mountain, where a stream-

let, born at the tail of a perennial snowdrift, in its progress towards the bottom has lost itself and thereby caused some boggy place. Here are to be found, often in abundance, the plants that are necessary to the existence of the Lepidoptera, and here, with few exceptions, we may expect to see the special butterflies that are the object of our search. They are not usually very abundant, for, with the exception of a few species, we may collect hard all day and get perhaps a dozen examples of what we want; but these will repay, by their beauty, their rarity, and their interest, the trouble taken in procuring them.

I left England on the evening of May 31st last, and travelling overland, *viâ* Sassnitz and Trelleborg, reached Stockholm on that of June 2nd. Here, amongst other events, I visited the Natural History Museum, and called upon the veteran Scandinavian lepidopterist, Professor Aurivillius, who received me most kindly, and courteously showed me the national collection of Swedish Lepidoptera.

Leaving Stockholm on the evening of June 3rd, I arrived at Mattmar, at the north-west corner of Lade Storsjö, in Jemtland, about noon the next day. The attraction for me at Mattmar was the very fine bog which exists there, and which is now unfortunately, from the lepidopterist's point of view, being drained. This swamp is covered with a growth of crowberry, cotton-grass, bog-bean, cloud-berry, lichens, moss, and dwarf birch and sallow, amongst which various charming flowers, including *Andromeda polifolia*, is abundant. Here and there in the drier parts straggling larches and pines maintain a precarious existence, the rising ground around the swamp being thickly covered with spruce and pine, with groves of birches in places.

I found at Mattmar a small hotel or inn, very clean and inexpensive, and the good people most obliging and anxious to do their best. After partaking of lunch and unpacking, I made for the swamp under the guidance of a friendly native, who spoke a little English, and who had, with the kindness and courtesy which I found everywhere in Sweden, offered to pilot me round. The day was sunny, and although it was late in the afternoon, I soon obtained examples of *Brenthis freija*, *B. frigga*, *B. aphirape* var. *ossianus*, *Chrysophanus amphidamas* var. *obscura*, which was abundant, and *Brenthis euphrosyne*.

The next day I annexed, in addition to further examples of the foregoing, specimens of *Erebia embla* and *Eneis jutta*, one only of each, unfortunately.

June 6th was unfavourable, and collecting was not possible; the next day, however, there were bursts of sunshine, and I obtained a fair number of specimens, including an example of *Hesperia centauriæ*; but was my last success at Mattmar, for the weather broke up entirely on June 8th, with snowstorms and arctic temperature. On June 9th I left for Åre, where there is

a large hotel, to await developments; unfortunately, here the weather got still worse, and for several day the sun was not visible, and there were blinding snowstorms each day at intervals. But on the 13th the sun did break out for a few moments, and happening just then to be down by the side of the lake, I found *Erebia lappona* beginning to appear in abundance, but by the time I had procured my net the sun had retired, and so had the butterflies, and I only succeeded, under these conditions, in kicking up three specimens. On June 14th the weather was worse than ever, and I began to wonder what it was like further north. Accordingly I rang up on the telephone the 'Turist Station' Hotel at Abisko, in Lapland, seven hundred and fifty miles distant, and ascertained that the weather was fine there, and that the season was considered an early one. This being the case, I decided I would give up further hopes of Jemtland.

It was very disappointing not to see certain of the butterflies of this province, which I believe has a rich lepidopterous fauna, and which information I received had led me to expect, but my experience confirmed the essential lesson one must learn with respect to the butterflies of Scandinavia, that it is of not the slightest use going to a district for a few days or a week. If one wants success, it is necessary to be on the ground immediately the species we require emerge, and to remain there until our object is achieved; which will usually mean a sojourn of several weeks.

On the afternoon of June 14th, I left Åre, bound for Abisko. The Lapland express had not then commenced to run, but by spending a night at each of the excellent railway hotels of Bracke and Boden, travelling by the ordinary train, I reached Abisko quite comfortably on the evening of June 16th.

Abisko has gone ahead since the days when Mr. Rowland-Brown visited it in 1906, not in all respects to the advantage of the naturalist. The hotel has been enlarged to an extent that, with its "dependences," it will accommodate near on two hundred guests; and it is usually crowded after July 1st. A station has been built just outside the hotel and named Abiskojokk, to which one should take one's railway ticket in preference to the station of Abisko, two kilometres further east. The Torne Träske is now served by a motor-launch, from which I hoped great things, for I was informed that by it I could easily reach the rich localities which undoubtedly exist on the north side of the lake. But I found that this launch was taken up, practically every day, in making excursions to the Lapp camp at the head of the lake, and as it only stayed there an hour or so, and there being no good ground near by, these trips were of not the slightest assistance to me. On one occasion, on July 7th, an excursion was made in the launch to the east end of the lake, and Herr and Fraulein Spröngerts, two German ento-

mologists staying at Abisko, and myself made arrangements with the captain to land us at Ortojokk—a place north-east of Abisko, where I had been informed good ground was to be found—on his journey out, and to call for us on his return. We managed to put in a few hours there, but we did not see the particular object of our search, *Colias hecla*, and except that *Eneis norna* was flying commonly during the few minutes sun that was vouchsafed to us, the expedition was unfruitful.

There is one place on the north side of the Torne Träsk, called Jebrenjokk, just opposite to Abiskojokk, where there is a tourist hut, and here, in July, I had hoped to spend several days; but, unfortunately, the weather, when I wished to go, was impossible. I should say that this hut is not favourably situated for obtaining Lepidoptera, for practically all the likely-looking ground to be seen from the lake is separated from it by a jokk, as a brook is called in Lapland. Incidentally, these jokks are usually unfordable torrents, almost entirely waterfall or rapid, and there are other jokks near by which would greatly restrict one's possible collecting-ground; I fancy, however, by working north amongst the mountains from the hut, given fine settled weather, some good collecting might be done.

Certain enterprising individuals of the professional class are credited with having taken away plants and insects from Abisko in the past few years for the purpose of converting into money. I heard of a dealer having rooted up in one season fifteen thousand plants, and of another who slaughtered twenty-five thousand insects. I cannot say that it would be impossible to convey away that number of plants, though I doubt if it was ever done; but with respect to the insects, in five weeks, working as hard as I could, I managed to amass a total of about two hundred and fifty butterflies, and I have not the slightest doubt but that it would be impossible for a collector to get together in a single season a tenth part of the twenty-five thousand if he collected all orders, unless, indeed, mosquitoes were included. One must therefore come to the conclusion that these reports are grossly exaggerated. The effect of them, however, has been for the Swedish Government to step in, and by statute make the district round the 'Turist Hotel' at Abisko "a national park," within the confines of which "Nature must not be interfered with." This track of country has a frontage along the shores of the lake of about six kilometres, and a respectable hinterland of, approximately, seventeen kilometres, and although the boundaries have not yet been fixed, there are maps of "the park" in every public room in the hotel, and a notice in each bedroom that any person infringing the law is liable to a fine of from five to one thousand kronas (eighteen kronas equal one sovereign); furthermore, any-one can prosecute, and as the prosecutor secures two-thirds of

the fine mulcted from the unlucky offender, it will be understood that visitors are not likely to sin against the statute, or incidentally naturalists to visit Abisko, in the future.

(To be continued.)

NOTES AND OBSERVATIONS.

HETERUSIA TAIWANA, NOM. NOV. *Heterusia formosana*, Wileman, Entom. xliii. p. 179, June 1st, 1910.—As the name *formosana* is pre-occupied in genus *Heterusia* by *Heterusia ædea formosana*, Jordan, subspecies of *ædea*, Linn. (See Seitz's 'Macrolepidoptera of the World,' vol. ii. Fauna Indo-Austral. 4th part = Exotica, part ix. p. 34, April 18th, 1908), I have renamed this Formosan species (which is allied to *Heterusia tricolor*, Hope) *Heterusia taiwana*.—A. E. WILEMAN.

EURIPUS FULGURALIS, Matsumura.—The type of this Formosan species, which is in the Taihoku Museum, North Formosa (*nec* Taiho ku) was described for the first time by me in the 'Entomologist,' xliv. p. 263, August, 1911. By error the description was headed, "*Euripus fulguralis*, Matsumura." This heading should read, "*Euripus fulguralis*, sp. nov.—A. E. WILEMAN.

OVIPOSITING OF SESIA APIFORMIS.—In confinement this species lays its eggs freely and loosely in a chip box, and I have often wondered how it disposes of them in a state of nature, as I have searched in vain for them on and about growing trees in which they bred. One morning early, in last July, my attention was called to a female at rest at the base of a large balsam poplar in my garden, and on watching it, I found it was engaged in laying, dropping its eggs loosely on the ground. It continued to do this for a long time and laid many eggs; and when it took to flight it examined other trees in the garden, and finding they were not poplars, flew away. Whether it invariably lays in this way, I do not know, and I think it unsafe to deduce a general rule from a single instance, but I may possibly have overlooked other records of similar observations which would tend to establish the rule.—W. H. HARWOOD; Colchester.

CORCYRA (MELISSOBLAPTES) CEPHALONICA AT COLCHESTER.—On September 24th, 1910, my son on returning home from a collecting expedition noticed a little moth which he could not make out, flying outside a warehouse here. It proved to be *C. cephalonica*, and in the course of the next few days we took a good series. They were mostly at rest, some were paired, and others flying freely in the late afternoon sunshine. We had never seen the species before, and are not likely to see it again about the same warehouse, which has since been thoroughly cleared out and is now used for an entirely different purpose; while the adjacent warehouses, where the moth also occurs to some extent, have been demolished altogether.—W. H. HARWOOD; Colchester.

PYRAMEIS ATALANTA, ab.—On August 25th last I bred from larvæ collected locally a beautiful aberration of *P. atalanta*. This insect

has the usually bright red on all four wings replaced by pale cream colour. Are there any previous records of a similar variety of this species?—ALFRED WM. LYNN; 37, Rodsley Avenue, Gateshead.

MELANIC EMATURGA ATOMARIA AT BURNLEY.—On May 27th, 1911, on the moors near Burnley, *E. atomaria* were flying freely in the sunshine, and for the first time I took three or four of the dark unicolorous males, as well as some intermediate forms.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

MELANIC EMATURGA ATOMARIA AT OXSHOTT.—I took a very dark male of the var. *unicolorata* here on May 11th.—H. WORSLEY WOOD.

TERATOLOGICAL SPECIMEN OF NOCTUA C-NIGRUM.—On August 11th I took at sugar on the Isle of Wight a curious form of *N. c-nigrum*. The only markings to be observed on the fore wings are the blackish marks on the costa and the narrow triangular patch just before the costal end of the subterminal line. The whole of the fore wings from the base almost to the subterminal line and from the costa to the hind margin are sub-diaphanous. The scaling is perfect, but the pigment is missing. The insect is perfectly formed.—E. EVERETT WARRIER; 6, Lytcott Grove, East Dulwich, S.E.

MACARIA LITURATA ab. NIGROFULVATA AT OXSHOTT.—Mr. D. F. Maitland, when collecting with me in this locality on July 7th, captured a fine female of the above variety.—H. WORSLEY WOOD; 31, Agate Road, W.

LIMENITIS SIBYLLA IN SEPTEMBER.—On the morning of September 18th I saw, to my great surprise, a female *sibylla* skimming across a high road between Colchester and Ardleigh; and on returning home in a different direction later in the day, noticed a second specimen flying over the railway and settling on some moist ground beside the metals. The species was fairly common in this district at the usual time of its appearance, when a good example of the black variety was taken; but I am at a loss to account for the late appearance of these two. Could they possibly be representatives of a partial second brood, or had they æstivated during the tropical heat of July and August and left their retreat when temperate conditions again prevailed? Both specimens were apparently full of life and vigour, and went through their customary evolutions as though it were a midsummer day, for which indeed they might very well have mistaken it.—W. H. HARWOOD; 94, Station Road, Colchester.

In reference to the note on a second brood of *L. sibylla* by Mr. Gervase E. Mathew in the 'Entomologist' for this month, I may state that in 1891 I had larvæ of this species, all of which duly hybernated, except three. These fed up rapidly and produced perfect insects in September of that year.—A. B. FARN; October 7th, 1911.

CYANIRIS ARGHIOLUS.—The spring brood of *C. argiolus* was four days earlier in my garden this year than last. The first noticed was on May 16th, a warm and beautiful day. I have seen and heard of nine of the autumnal brood here this season.—JOSEPH ANDERSON; Chichester.

BUTTERFLIES IN A GARDEN AT CHICHESTER.—On September 11th last several *Vanessa io* and *urticæ*, *Pyrameis atalanta*, and *P. cardui*, were flying over and settling upon the flowers in the garden here.—JOSEPH ANDERSON; Alre Villa, Chichester.

BUTTERFLIES IN OCTOBER.—At the present time a third brood of *Pararge megæra* is out, and also a second brood of *Satyrus semele*. Up to October 3rd I noticed specimens of a third brood of *Pieris brassicæ*; is not this very late?—J. W. MUIRHEAD; 31, Fairhaven Road, St. Anne's-on-the Sea, Lancashire, October 18th, 1911.

PARARGE MEGÆRA.—A third brood of *P. megæra* began to appear about the middle of September and has been common in all directions hereabouts; it is still well in evidence, though time is telling upon it.—W. H. HARWOOD; Colchester, October 10th, 1911.

CHRYSTOPHANUS PHLEAS.—This species seemed to be quite common near Bedford on October 1st.—W. J. LUCAS; Kingston-on-Thames.

This species has been unusually abundant here this autumn.—H. M. EDELSTEN; Forty Hill, Enfield.

CHRYSTOPHANUS PHLEAS IN THE CITY.—Whilst I was crossing London Bridge on the afternoon of September 23rd, a specimen of *C. phleas* settled on my arm. This seems rather an unusual insect to meet with in the City of London.—F. H. STALLMAN; 6, Maley Avenue, West Norwood, September 25th, 1911.

CHRYSTOPHANUS PHLEAS VARIETIES.—The third brood of this species was out during the last week in August; some specimens look quite fresh yet, and I have one good-sized larva still feeding. I have examined many hundreds of wild specimens, and to my surprise have seen none of the var. *cæruleopuncta*, St. amongst them. Among those I bred were some brilliant examples of this form. I have also captured several nice varieties, including two similar to those figured in South's 'Butterflies of the British Isles,' plate 101, figs. 11 and 12. The variety recorded (*antea*, p. 320), which I saw on *Inula* but failed to capture, was a somewhat suffused example of var. *schmidtii*, and not var. *eleus*, which through some inadvertence is given as its name.—W. H. HARWOOD; Colchester.

LIMENITIS SIBYLLA: A SECOND BROOD.—With regard to Mr. Gervase Mathew's very interesting note (*antea*, p. 327) upon a second emergence of the White Admiral in Essex, and his remark that "it does not appear to be double-brooded on the Continent. . . ." I find that (Les Premiers Etats des Lépid. Français, p. 150, St. Dizier, 1906) Professor Frionnet gives as the season of emergence June to July, sometimes August to September. M. Dupont (Cat. des Lépid. des Environs de Pont-de-l'Arche) writes as follows: "Twice in the forest of Bord I have taken this species quite fresh in September; one example, Sept. 11th, 1898, another Sept. 23rd, 1900. Is there a partial second generation in warm and dry years?" And it is, no doubt, on the excellent authority of M. Dupont, coupled with that of M. Alfred Giard, who observed isolated examples in September (1902?) near Valenciennes, that M. Frionnet relies; unless we are to understand that a second brood has been observed in his own Department of Haute-Marne.

In the hot Departments of the Midi *sibylla* apparently does not exist: at all events it is not included in my published lists for the Alpes Maritimes (Riviera), Var. Pyrénées-Orientales, &c. But it is common in the plains of the Basses-Pyrénées, where a partial second brood might be expected even in normal summers. *L. camilla* is, of course, invariably double-brooded in the south of France, but towards its northern limits, it seems, there is only one emergence. For example, M. Charles Oberthür reports (Lépid. Comparée, fasc. iii. p. 185) on the forest of Rennes, Ille-et-Vilaine: "With us we find it there from the beginning of June on into August," and at Blois M. Chevillon mentions one brood only (Bull. Soc. Hist. Nat. Loir-et-Cher, 1884).—H. ROWLAND-BROWN; Harrow-Weald, October 7th, 1911.

PHRYXUS (DEILEPHILA) LIVORNICA IN THE NEW FOREST.—On August 28th I was shown a very fine specimen of *P. (D.) livornica* which had been found at rest on a garden fence in Brockenhurst on the 23rd. The lateness of the date and the perfect condition of the insect point to its having been bred in the neighbourhood.—G. T. LYLE.

PHRYXUS LIVORNICA IN SURREY.—I captured a specimen of *P. livornica* flying over a head of *Phlox* in my garden here on August 3rd last.—E. C. JOY; Eversley, Dale Road, Purley.

PAPILIO MACHAON IN HERTS.—A single specimen of *P. machaon* was caught in June this year at Bishop's Stortford, more than thirty miles from Wicken. It is, of course, not at all unusual to see them in Norfolk villages a mile or two from their food-plant, but this year they evidently wandered to a most unusual extent.—C. MELLOWS; Bootham School, York.

PAPILIO MACHAON IN MIDDLESEX.—On August 17th my wife captured a very large female specimen of *P. machaon* in the garden here. It came down to a bed of geraniums. I cannot trace anyone having let one out in this neighbourhood.—H. M. EDELSTEN; Forty Hill, Enfield.

PAPILIO MACHAON AND SPHINX CONVULVULI IN ESSEX.—In view of Mr. Harwood's record of *P. machaon* in Colchester, I am induced to mention that two specimens of this insect were seen during the summer in this village, which is ten miles from Colchester. I had hesitated to place these on record, as I fancied they must have been "escapes," but it now seems probable there was a partial migration of the insect. At any rate, I know of no collector nearer here than Mr. Harwood himself. I may also record the capture of three *S. convulvuli* in my garden here in August.—PERCY C. REID; Feering Bury, Kelvedon.

THIRD BROOD OF NOTODONTA ZICZAC.—It may be of interest to record a third brood of *N. ziczac*. The first imago emerged during the last week in April, the second brood during the first week in July, and of two dozen pupæ obtained from the second brood two perfect insects emerged on August 26th and 30th respectively. The young larvæ from the second brood were kindly sent to me by Miss Edwards of East Grinstead.—R. T. BAUMANN; Glendale, Chingford, Essex, October 25th, 1911.

SECOND BROOD OF EUROIS PRASINA (APLECTA HERBIDA).—Probably due to the abnormally hot summer a second brood of *A. herbida* has been emerging since September. The perfect insects I have found in the larvæ cage, containing at present half size and nearly full-fed larvæ, so that I anticipate further emergences. The dates of emergences are September 18th and October 1st, 2nd, 5th, 8th, and 18th. The young larvæ were kindly given to me by Mr. Hugh Main, and originate from Eastbourne.—R. T. BAUMANN.

TORTRIX PRONUBANA AT WESTCLIFF-ON-SEA, ESSEX.—The above Tortrix has appeared here: I met with its larva when walking in this district one day in mid-August. In passing a privet hedge I noticed two or three of the leaves on the top of the hedge fastened together, and on examining them I found what I thought were Tortrix larvæ. As I could not call to mind any Tortrix larva that would be feeding on privet at this time of the year, I thought they might be something out of the common, so I searched further on following days and found altogether about twenty larvæ and pupæ. The first insect was bred on September 9th, others following on succeeding days. I had never previously seen the moth either alive or in any British collection, so for a time I assumed it was possibly a new species to this country, and that I was the fortunate discoverer. My dream was, however, soon dispelled, as on looking through the back numbers of the 'Entomologist,' I came across Mr. Adkin's very interesting article (*vide* 'Entomologist,' vol. xxxix, p. 265) on his finding *T. pronubana* at Eastbourne, and after reading same and his full description of the imago, I found that my captures were referable to this species. As I have not seen any mention of the previous capture of *T. pronubana* in Essex, this may be the first record for the county. I have now (September 20th) found this insect in three separate places in Westcliff, but they are of small extent, two of them being private gardens. In one locality, three larvæ and one imago occurred on *Euonymus*; in the other localities privet was the food of the larva.—G. H. CONQUEST; 10, Meteor Road, Westcliff-on-Sea.

LEUCANIA UNIPUNCTA (Haworth) EXTRANEA (Guenée) IN DEVONSHIRE.—On September 20th I was fortunate in taking a fine female specimen of this insect at sugar on the Devonshire coast. Ova were not obtained, although the moth was not killed for two days. The species appears to be very sluggish when boxed and to show but little inclination to move, although on the "sugar" it was by no means easy to capture.—(Dr.) BECKWITH WHITEHOUSE; 52, Newhall Street, Birmingham.

CARADRINA EXIGUA IN DEVONSHIRE.—Between September 11th and 28th I took five fine examples of this insect at sugar. With one exception all were captured between ten and eleven o'clock and after a heavy fall of rain. It appeared probable that the latter had driven this rather sluggish insect from its resting places in the long tufts of grass. Ova were obtained from a female captured on September 11th, and the larvæ hatched between the 20th and 22nd. At the time of writing (October 9th) they are in the third "instar," and feeding rapidly upon dock. Previous to the second moult, the larvæ are

distinctly gregarious, and an interesting point in this connection was noted. Two batches of ova hatched on different days, but all the larvæ were placed in the same small box. Although this mixing had taken place, at the end of twelve hours, two distinct colonies were formed; and this arrangement was maintained until the second moult was completed. A few days elapsed between the corresponding moult of each colony, indicating the different ages of the same. The colony was always formed on the under surface of the leaf, and care was taken by the larvæ to devour the parenchyma but to avoid the production of holes in the pabulum. In the third instar the larvæ tend to wander further afield and to seek solitary shelter in the curled edges of a leaf. At night they issue further and travel rapidly over the leaves, but always return to the under surface or rolled margins by day.—(Dr.) BECKWITH WHITEHOUSE; 52, Newhall Street, Birmingham.

CYANIRIS ARGHIOLUS AND L. ARION.—A short time ago small black marks were noticed on some unexpanded ivy buds. On examination these marks proved to be small circular holes, varying from about $\frac{1}{32}$ in. to $\frac{1}{16}$ in. in diameter, the whole of the interior of each bud having been cleaned out. On searching the bush at night (about 8), eight larvæ of *C. argiolus* were found feeding upon the flower-buds, the small heads and necks of the larvæ being thrust through an astonishingly small hole. During the daytime no larvæ could be found by the closest searching. On beating the bush into a tray at 9 p.m., however, about twenty larvæ were taken, varying in length when at rest from $\frac{3}{16}$ in. to $\frac{5}{16}$ in. Is this larva exclusively a night feeder? Since the foregoing notes were written, one *C. argiolus* larva has eaten two other larvæ and four pupæ, nothing but the shells of the latter being left. There were originally seven larvæ in a roomy glass-bottomed pill-box, and they were well supplied with ivy flower-buds; these buds had, however, apparently been neglected. Does the larva of *L. arion* during any stage feed upon the larvæ of *Formica rufa*?—G. B. KERSHAW.

RARE COLEOPTERA AT HINDHEAD, SURREY.—I should like to record having taken at Hindhead, amongst other rare beetles, *Onthophagus taurus* and *Monochammus sutor*.—A. RICHARDS; c/o Lady Agatha Russell, Rozeldene, Hindhead, Haslemere.

LAMPIDES BÆTICUS IN GUERNSEY.—As I write (September 19th), *L. bæticus* is still disporting itself in view of my window. There has been a considerable number of this species with us since the beginning of the month. On August 11th I first saw some worn specimens of an earlier brood, probably immigrants, including females, flying round a bush of *Colletia arborescens*, close to my study window. I was therefore on the look-out for a September display, and have not been disappointed. Though not so common as in the year 1899, it seems to have bred very extensively in the island; I have taken some forty specimens in my garden, and could have easily taken as many more. I placed two females in a muslin cage, with food-plant, and have got a fair supply of eggs, but hardly expect that I shall bring them to a successful issue at this late time of the year.—F. E. LOWE; S. Stephen's, Guernsey.

NOTES ON LEPIDOPTERA IN VARIOUS LOCALITIES.—I was at Lyndhurst during the second fortnight in July. My experience in that fine locality was similar to that of other observers in different parts of the country. Sugar failed to attract, and there was an abundance of honeydews. I had the pleasure of seeing *Apatura iris* flying high over the Rhinefield Walk. I had also the satisfaction of seeing *Aciptilia paludum* on some bog-land near Whitley Wood, and was able to take it freely, so freely that once or twice I had half a dozen examples in my net at the same time. The time of flight appears to be from 6 until about 7.15 p.m. *Catocala promissa*, just emerged, was found on an oak-trunk at Queen Bower. *Argynnis paphia* (male) was pretty well over, and fair specimens of the female were difficult to obtain. Of var. *valesina*, I got one only in fair cabinet condition. *Limenitis sibylla* was about, but much battered. A nice melanic *Cleora glabraria* was found, and the following: *Zygæna trifolii*, *Lithosia helveola*, *Gnophria quadra*, *Cænobia rufa*, *Hypnoides costæstrigalis*, *Selenia tetralunaria*, *Cleora lichenaria*, *Tortrix cratægana*, *Peronea sponsana*, and *Phoxopteryx inornatana*. I also found a few larvæ of *Notodonta trimacula* and *Cidaria siterata*; also one full-fed larva of *Sphinx ligustri* crossing a forest-path. I spent a week at Tenby in early August in very unsettled weather and explored the pine-woods near Scotsborough and Saundersfoot without seeing a single insect of special interest. A few *Pyrameis cardui* occurred; *Sciaphila conspersana* and *Sericoris cespitana* were found on the sandhills; also *Spilonota incarnatana*. A run over to Cuxton, in Surrey, on June 23rd resulted in my getting, for the first time, *Oxyptilus parvidactyla*. I bred in September, from a larva found feeding in July on a ripe Canary banana, a moth which has been identified for me at the British Museum as *Sesamia* (*Sesamia*) *vuteria*, Stoll.—F. G. WHITTLE; 7, Marine Avenue, Southend, September 7th, 1911.

LEPIDOPTERA OF SCOTLAND IN AUGUST.—I spent a fortnight in August on an entomological trip to Scotland—the first week at Forres, in company with my friend Mr. W. C. Cope, the second week at Kinloch, Rannoch, by myself—and I thought that some of your readers might be interested in a few notes on what I saw. During the whole period there was no rain, except for a slight thunderstorm the night of my arrival at Kinloch. Every day was fine and bright, and the nights as a rule mild, except that a cool easterly wind blew on three or four nights at Kinloch. Owing to the weather conditions sugar was a blank, and watching heather-blossom had to take its place. At Forres, our chief resort was the riverside, near the Ferry, the Findhorn Sandhills, and the Culbin Sands and Buckie Loch, where, as the shooting is preserved, we had to obtain leave to go. By the riverside we found *Melanthia rubiginata* common, with a fair percentage of var. *plumbata*, *Coremia imminata* in numbers on the ragwort, a few *Plusia bractea* at *Teucrium*, *Selene*, and other flowers, five or six *Noctua depuncta*, and an odd *N. dahlia* or two. At the Findhorn Sandhills we took *Agrotis cursoria* in very handsome varieties, *A. valligera*, *A. tritici*, *A. nigricans*, *Triphæna orbona* (var. *curtisii*), and several *Stilba anomala*, and *N. festiva*. On the

Culbins, the small birch-bushes gave larvæ of *Notodonta dromedarius* and *Acronycta leporina*, and those on Buckie Loch, numbers of *Demas coryli*, *Orgyia antiqua*, *N. dromedarius*, *Ennomos tiliaria* and *E. angularia*, *Phalera bucephala*, and one *Cerura furcula*. Working there at dusk was most disappointing, as we took nothing but *C. munitata* and *Phibalapteryx lignata*. At Kinloch, Rannoch, I confined myself entirely to the south side of the loch, and except for one fruitless journey to the Black Wood never went farther than Cairie. One day after *Larentia flavicinctata* only gave me four specimens, but *L. cesiata* was very common. I also took a dozen or so *Carsia imbutata*, but they were getting worn, and I released most of them. I saw no *D. obfuscata* at all. Larvæ comprised *N. ziczac*, *N. dromedarius*, *A. leporina*, *C. or*, *C. duplaris*, *O. antiqua*, *D. coryli*, *S. populi*, *S. ocellatus*, *N. dictæoides*, *C. furcula*, &c. The last-named I beat from sallow, but on arriving home, being pressed for room, I put them in a breeding-cage in which were other larvæ of various sorts feeding on aspen, and, to my surprise, the *furcula* entirely forsook the sallow and fed on the aspen! My nights were spent watching heather-blossom on the flat at the south-east corner of the loch, and the bag contained representatives of *S. anomala*, *N. dahlii*, *D. suspecta*, *N. glareosa*, and *E. lutulenta*. The last day of my visit (August 19th) I took six *Polia chi* (quite normal) off the roadside walls. The number of insects taken altogether was not great, though they comprised a good variety. Larvæ I found very scarce, except perhaps at Buckie Loch and in Cairie Wood. But I much enjoyed the Scotch air and the beautiful weather.—PERCY C. REID; Feering Bury, Kelvedon, September 9th, 1911.

ERRATUM.—Page 324, line 29, for “I. C. Gunton” read “H. C. Gunton”; and line 30, for “August 9th” read “September 9th.”

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, June 7th, 1911. — The Rev. F. D. Morice, President, in the chair. — The Secretary observed that he had exceeded his instructions with regard to the Memorial passed at the last meeting, on the subject of the South Kensington site, and had sent it to the ‘Times,’ where it had appeared, and to the principal Press Associations, as well as (at the request of Mr. Waterhouse) to the Director of the Natural History Museum.—Commander J. J. Walker exhibited specimens of *Barypithes pellucidus*, Boh., from Oxford, Enfield, and Tavistock respectively, and for comparison, *B. duplicatus*, Keys, from the Blean Woods and Birchington, Kent. Also a series of specimens illustrating the life-history of *Cyclotorna*, Meyrick, a genus of myrmecophilous Lepidoptera, from Queensland, sent by Mr. F. P. Dodd with his paper on the insects subsequently read.—Mr. Donisthorpe, live specimens of *Antennophorus uhlmanni*, Haller, on the hermaphrodites from a nest of *Lasius umbratus* at Woking. Only two specimens have been taken before in Britain, by Michael, in an ant’s nest

at Land's End. Also *Uropoda philoctena* fastened on the strigil of an hermaphrodite of the same ant from the same locality. This species is new to Britain.—Mr. C. O. Waterhouse, larvæ of a species of *Hypoderma* received from India from Mr. J. E. Middleton, with a note that they had been taken from a gazelle and were probably an undescribed species. Mr. Waterhouse expressed the strongest doubts as to the possibility of determining a species of *Hypoderma* from the larvæ. There is, however, no Indian *Hypoderma* described hitherto.—Mr. F. Enock, a photomicrograph of a new species of *Mymar*, which he has named *M. regalis*, accompanied by one of *M. pulchellus* for comparison, captured June 3rd, 1911, at Burnham Beeches. Not only are the posterior wings greatly elongated into a very narrow battledore with six long hairs on the lower margin, but the anterior wings are surrounded with *sixty* long hairs—instead of the thirty-five of *Mymar pulchellus*.—Mr. H. Rowland-Brown, some drawers of Miss Fountaine's bred series of African *Charaxes*.—Dr. Chapman, a box of insects to illustrate a case of mimicry, remarking that in March and April, both at Hyères and at Amélie-les-Bains, his attention was attracted to a Reduviid bug, *Pirates hybridus*, Scop. He followed up one or two on the wing, taking them for Pompilid Hymenoptera, and when they settled on the ground their movements were precisely those of *Pompilus* when hunting on the ground—sharp, active, jerky, and taking wing at once if alarmed. The red colouring on the elytra was, when running, much like the red of a Pompilid body between or under the wings. On picking up the bug, it often occurred that one was stung, about as sharply as many Pompilids do, and some are fairly proficient therein. The sting was of course the thrust of the beak or proboscis, of which not a few Reduviid bugs can make effective weapons of defence. The sting enhances the resemblance to an Aculeate. Dr. Chapman also observed that at Hyères, on March 29th, 1911, he found, on turning over a stone, under its edge a small nest of *Polistes gallica*. The nest consisted of eight small cells, in each of five of which was one egg. It could not have been founded very long. Under it (above it before the stone was turned over) there rested not one female but two females side by side. The advancement of the nest showed that it was impossible for one of these to be a worker reared in the nest. The question was, were they working together, or was one only a casual visitor, taking shelter during the inclement weather? In the latter case, would it not have been regarded and treated as an enemy, instead of both resting together in a thoroughly friendly way? Dr. Chapman also exhibited some well-grown larvæ of *Callophrys avis* from the Riviera.—Professor Poulton, on behalf of Mr. A. H. Hamm, assistant in the Hope Department of the Oxford University Museum, a case of insects illustrative of certain associations of mimetic British Hemiptera-Heteroptera, with their hymenopterous models, the chief object being to record that the Hemiptera are to be found in the localities frequented by their models, and often in their company. Field observations are especially important on the mimics of insects, such as the Hymenoptera-Aculeata, with extremely characteristic habits

and movements.—Professor Poulton, a family of *Papilio dardanus*, consisting of the *trophonius* parent and the fifty-five offspring reared from her eggs by Mr. G. F. Leigh, F.E.S., of Durban, and containing a new female form *leighi*. The female parent of the family exhibited was captured by Mr. Leigh on June 26th, 1910, at Pinetown, Natal (about 1000 ft.). She laid sixty-two eggs on June 27th–28th, the offspring consisting of twenty-five males, twenty-two *cenea* females, four *trophonius* females, two *hippocoon* females, and two *leighi* females. There can be no doubt that this variety, bred in Natal by Mr. Leigh six times in 1910 and also captured twice in Natal, possesses sufficient stability to rank as one of the female forms of *dardanus*. Further convincing evidence of its stability as a form is seen in the fact that it also occurs almost unchanged so far away from Natal as the north-east corner of the Victoria Nyanza. A specimen was collected by Mr. A. H. Harrison about 1903 at “Nyangori,” a forested locality at a height of about 5000 ft. to the north-east of the great lake. Mr. Harrison’s specimen was figured, seven-eighths of the natural size, in Trans. Ent. Soc. 1906, plate xx. fig. 1. It is there spoken of as “intermediate between *planemoides* and *cenea*.” The *planemoides* form is entirely unknown in Natal, and indeed in areas far to the north of it, and hence it is impossible to adopt the plausible interpretation of *leighi* as a hybrid between *cenea* and a male bearing the *planemoides* tendency, or *vice versa*. We are therefore driven to the hypothesis that the *leighi* form is a persistent definite stage in the evolution of *planemoides*. Professor Poulton also exhibited an example of the *planemoides* female captured in August, 1910, in forest country (less, and probably much less, than 100 ft. elevation) between Jilore and Malindi. The occurrence of *planemoides* on the east coast, so far from its *Planema* models, is of high interest. Professor Poulton also exhibited a female parent of the *dubia* form captured on March 19th, 1911, at Oni, seventy miles east of Lagos, by Mr. W. A. Lamborn, together with a selection from the offspring reared from its ova. The offspring included both *dubia* and *anthedon*. Thus Mr. Lamborn had been able to verify the suggestion that the forms *Euralia anthedon* and *E. dubia* are the dimorphic forms of a single species. It may be added that Mr. Lamborn has now bred families from three *dubia* parents of various forms, and one from an *anthedon* parent, all captured at Oni in March of the present year. Both *anthedon* and *dubia* appeared in all the families. Mr. W. A. Lamborn had intended to show at this meeting the cases which he had exhibited at the *Conversazione*, but, owing to a misunderstanding, they had not arrived. He observed, however, that Professor Poulton’s account of the mimicry of certain Danaine butterflies by *Euralias* induced him to mention that he recently took at one sweep of the net two butterflies, an *Amauris psytalea*, Plötz, and an *Euralia dubia*, which were flying round and round each other in a manner suggestive of courtship. Their movements on the wing were so active that he was unable to recognize them before capture, and it seemed evident that the one must have been deceived by the mimetic resemblance to its own species exhibited by the other. In the exhibit which he had hoped to bring was a West African Hypsid moth determined by

Professor Poulton as *Deilemera*, probably *antinorii*, Obth., with the cocoon from which it emerged, which bears a large number of creamy white semi-transparent frothy spheres which bear a very strong resemblance to the cocoons of Braconid parasites, and doubtless have a protective function. He added that in January of this year he observed a male *Amauris niavius*, L., settle on the upper surface of a leaf with its wings expanded. The insect flexed its abdomen, making the dorsal surface convex, so that the extremity of the body was brought level with the brands, and the tufts were then thrust out. By alternately flexing and straightening out the abdomen the tufts were passed to and fro over the surface of the brands as though some secretion was being conveyed from the one to the other. Professor Poulton has suggested that the greasy appearance of the brands may be probably interpreted on the hypothesis that they serve to retain and distribute a scent employed in courtship brought to them by the tufts. Dr. Longstaff said that he was satisfied that in *Euphea* and *Limnas chrysippus* the characteristic scent was not caused by the tufts and brands, though these were very likely the cause of another volatile scent which certainly existed in these cases. Female Danaids have a scent as well as males; the scent common to both being nauseous, while that peculiar to the male is probably a help in courtship. Professor Poulton remarked that the brands actually are greasy, and not merely look so, and that they may for a time hold scent imparted by the tufts. Dr. Jordan observed that the discovery in Natal of intermediates between *cenea* and *planemoides*, which from previous experience had been supposed not to exist, made it impossible any longer to argue from their non-existence in favour of the sudden, as opposed to the gradual, evolution of dimorphic forms.—Commander J. J. Walker read the following paper: "Some Remarkable Ant-friend Lepidoptera of Queensland," by F. P. Dodd, F.E.S., with Supplement by E. Meyrick, B.A., F.R.S.—GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 27th*, 1911.—Mr. R. Adkin, F.E.S., in the chair.—Mr. Kenneth J. Blair, of Highgate, N., was elected a member.—Mr. West, numerous interesting captures in the New Forest, including *Egeria speeciformis*, a suffused specimen of *Anthrocera trifolii*, a short series of *Cicadetta montana*, including the rarely met with female, and the rare Heteropteron *Elysarcoris æneus*.—Mr. Stanley Edwards, the very beautiful Lycænid *Stalachtis evelina* and several beautiful species of the genus *Mesosemia* (Lemoniinae).—Mr. R. Adkin, a pair of *Endromis versicolor* reared this year from ova deposited in 1908, thus three years in pupa.—Mr. Blenkarn, a teratological example of *Carabus nemoralis*, in which the tibia of the right fore leg was divided into three, each terminating in perfect tarsi and claws; two specimens of the rare *Helophorus tuberculatus* and *Galerucella fergussoni* from Lanarkshire; and the curious Hemipteron *Ledra aurita* from West Wickham on oak.—Mr. Jäger, a Nematoid worm which had emerged from the larva of a *Cucullia*.—Mr. Sperring, a number of aberrations of Lepidoptera, including a smoky suffused specimen of *Cosmotriche potataria* from Bentfleet, a seven spotted *Anthrocera*

filipendule, a *Callimorpha dominula* with very dark hind wings and ill-developed scaling, two specimens of *Arctia caia*, one having asymmetrical markings and the other with yellow hind wings, and a number of *Abraxas grossulariata*, considerably darker than normal specimens, many having the black massed mainly towards the outer margin. He called attention to the fact that most of the bred aberrations were either early or late emergences of the brood.

August 10th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Jäger exhibited a specimen of the large spider *Mygale avicularia*, sent to him from India, and communicated notes on its habits. He also showed a specimen of a scorpion from the Asiatic shore of the Bosphorus, and described its habits.—Mr. West (Greenwich), a series of *Asemum striatum* and var. *agreste* from the New Forest, a male and two females of the very rare *Monochamus sutor* from Deptford, *Acocephalus trivinctus*, a recent addition to the British list from Great Yarmouth, with *Plagiognathus albipennis*, obtained from *Artemisia maritima*, *Aræspus pulchellus*, and *Chlorina glaucescens*, all from the same place.—Mr. Carr, the two grasshoppers *Stenobothrus bicolor* and *Platyceles brachyptera*, from Oxshott.—Mr. Blenkarn, *Quedius talparum* (*vexans*), recently new to science, from moles' nests in the Isle of Wight, and a double-banded form of *Noctua rubi* from Beckenham.—Mr. Dods, living larvæ of *Samia cecropia*, a large American silk-producing Saturniid.—Mr. Carr, the local beetle *Cicindela sylvatica* from Oxshott.—Mr. Edwards, a box containing several species of the genus *Libythea*, and contributed notes on the singular distribution of the few known species.

August 24th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Jäger, the following forms and aberrations of British Lepidoptera, very dark *Argynnis aglaia*, *Pieris napi*, and *Venusia cambrica*, *Rumicia phleas*, with wedge-shaped spots replacing the band, a very silvery female of *Celastrina argiolus*, two very curious dark forms of *Acidalia marginepunctata*, and a very aberrantly marked form of *Hydriomena ruberata*.—Mr. S. R. Ashby, series of *Balaninus nucum* and *Phytodecta pallida* taken during the Field Meeting at Clandon, July 15th.—Mr. Turner, forms of *Papilio podalirius*, including var. *feisthamelii* ab. *ornata*, and two examples partaking of the ab. *undecemlineatus* and ab. *nigrescens* forms.—Mr. Turner contributed a note on the habits of the thread worm, one of which had been recently exhibited, found in the larva of a *Cucullia*.—Mr. R. Adkin, forms of *Hesperia malvæ* closely approaching var. *taras* from Sussex, and an intermediate example of *Aplecta occulta* from Rannoch, where the species is usually very dark.—Mr. Morford, *Colias hyale* and a second brood specimen of *Nisoniades tages* from Mickleham, August 20th.—Mr. West (Greenwich), two local Diptera, *Ceroxys pictus* and *C. omissus*, from Great Yarmouth salt-marshes.—Mr. West (Ashted), the rare burying beetle, *Necrophorus interruptus*.—Mr. Main, a portion of wasp-comb, and described the feeding of the larva.—Mr. Edwards, *Papilio codrus* and allied species.—Mr. Blenkarn, several living stick insects, *Dixippus morosus*, from India.—Mr. Kaye, a specimen of the extremely rare Sphingid, *Pholus typhon*, from Mexico.—Dr. Chapman, living larvæ of the high level

Lycænids, *Laticornia orbitulus*, *Vacciniiana optilete*, and *Albula pheretes*, from the Alps.

September 14th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Turner exhibited a photograph of a very dark specimen of *Lithosia deplana* (*helveola*), sent him by Mr. Cockayne, and asked if such melanic specimens had been recorded.—Mr. Grosvenor, an extensive series of *Pieris napi* taken and bred in 1911, selected to show every phase of variation obtained, including a gynandromorph, a male with female markings, specimens of yellow general coloration, &c.—Mr. West (Greenwich), *Teratocoris antennatus* and *Nabis lineatus*, two uncommon species of Hemiptera from near Gravesend.—Mr. Gibbs, long and varied series of *Satyrus semele* var. *aristæus*, *Pararge megæra* var. *tigelius* and *Epinephele jurtina* var. *hispulla* from Corsica.—Mr. Kaye, young larvæ of *Rumicia phlæas*, *Plusia bractea*, and a very rare Sphingid, *Xylophanes isaon*, taken by him in South Brazil.—Mr. Curwen, a large number of aberrations of British Lepidoptera.—Dr. Chapman, empty and full galls of *Andricus ostæus*, the peppercorn gall.—Mr. Barrett, living larvæ of *Syntomis phegea* from Sicily.

September 28th.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. Kaye exhibited a long series of *Ephyra pendularia*, including some very beautifully marked examples of ab. *subroseata*.—Capt. Cardew, a beautiful series of *Hadena contigua*, bred from ova laid by a New Forest female; forty-nine imagines were obtained from sixty-two fertile ova.—Mr. Moore read a short note on a visit to the Forest of Arques recently made, and exhibited a number of butterflies he obtained. He referred to the abundance of *Pieris napi* and the scarcity of *P. rapæ* in the forest about August 12th last.—Mr. Moore exhibited a specimen of *Agrius convolvuli* taken in Deptford, the only one noted by him this season.—Mr. Main, a bred example of *Aplecta prasina* (*herbida*) remarkable for the delicacy of its colouring. Some of the larvæ, he remarked, were still small, others had pupated, and this moth had emerged.—Mr. Buxton, a long series of *Hadena protea* from near Tonbridge, taken at sugar, and of *Anthrocera hippocrepidis* (?); one specimen of the latter had the antennæ short, but very thick and contorted.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The opening meeting of the session was held at the Royal Institution, Colquhoun Street, Liverpool, on Monday, October 16th, 1911.—Dr. P. F. Tinne, Vice-President, in the chair.—This being the meeting of the Society fixed for exhibits, these were the feature of the evening.—Mr. B. H. Crabtree brought a fine bred series of *B. repandata* from Cornwall and Delamere; a very fine and varied series of *E. autumnaria* from Southend ova; *A. ashworthii* and *lucernea* from Penmaenmawr; *H. suasa* from South Manchester larvæ; *A. nebulosa* and var. *robsoni* from Delamere larvæ; *A. selene* and *C. davus* from Haverthwaite Mosses; *E. epiphron*, *A. plantaginis*, and var. *hospita* from the Westmorland mountains.—Mr. R. Tait, Junr., exhibited a long series of *A. grossulariata* from a garden in Huddersfield, showing

an exceptional range of variation; *B. repandata*, including var. *conversaria*, Penmaenmawr var., &c.; *D. fulcataria*, *D. russula*, *A. strigillaria*, *M. murinata*, *G. papilionaria*, *C. mesomela*, *A. tincta* from Wyre Forest, June, 1911; bred typical form of *P. betularia* from Pendine, South Wales, 1911; *A. advena* and *B. roboraria* from Monkswood, June, 1911.—Dr. P. F. Tinne's exhibit consisted of a nice series of variations of *Polyommatus phleas* collected on the coast of Donegal during August, 1911. These included var. *argentea* and specimens showing extreme forms with light and heavy black markings.—Mr. Wm. Mansbridge had a long series of *Selenia bilunaria* showing dense fuscous irroration, from a Delamere female; also a new form, ab. *brunnearia*, from the same locality; a long series of *Aplecta nebulosa* and vars. from *robsoni* parents. The results were contrary to usual experience with this parentage, the progeny being as follows: 49 per cent. *robsoni*, 6 per cent. *thompsoni*, and 45 per cent. grey forms with typical markings; the last being remarkable as showing a full range of variation *inter se*, from the palest Delamere variety to the darkest, nearly all, however, possessing the typical markings; a series of *Abraxas grossulariata* from Huddersfield, which included the usual well-known West Riding variations.—Mr. A. W. Boyd exhibited a box of Micro-Lepidoptera collected in Lancashire and Cheshire during the past season.—Mr. F. N. Pierce, a box of Huntingdonshire Lepidoptera.—WM. MANSBRIDGE and OSCAR WHITTAKER, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—June 6th, 1911.—*Epione apiciaria*. Mr. A. W. Mera exhibited larvæ of this species and remarked on the prolonged period of hatching of the ova which resulted in some being still unhatched, while these larvæ were almost full-fed.—*Eupithecia extensaria*; a living imago bred from Hunstanton larva. Mr. L. B. Prout.

June 20th, 1911.—*Nola confusalis*, melanic; a series from Epping Forest, including one very dark example. Mr. H. B. Williams.—*Selene illunaria*, ab.; a specimen of almost unicolorous grey colour with usual transverse lines only very faintly indicated. *Ibid.*

September 5th, 1911.—*Lycæna corydon* abs.; a series from Royston (Camb.), including var. *semisyngrapha* and two brown suffused under sides. Mr. C. P. Pickett.—*Lycæna argiolus*, dwarfs. Two very small specimens of third brood from Leytonstone. *Ibid.*

September 19th, 1911.—*Uropteryx sambucaria*; two series, the one bred in heat and the other at ordinary temperature; the former were on the whole slightly larger. Mr. C. P. Pickett.—*Tephrosia crepuscularia*; second brood series from New Forest and Swansea; those from the latter district were very dark. Mr. A. W. Mera.—*Emmelesia albulata*; a bred series from Shetlands. Mr. F. B. Cross.—*Ennomos autumnaria*; a single specimen taken wild at Ramsgate. September 11th, 1911; also long series from Dover and Chichester, Mr. A. J. Willsdon.—*Catocala nupta*, ab.; an example from Finchley with usual red ground colour of secondaries replaced by purplish brown. Mr. B. S. Williams, on behalf of Mr. Bloomfield.—*Lycæna corydon*, abs.; a series from the North Downs, including males with

broad bordered primaries, male approaching ab. *fowleri*, another with orange on secondaries, and a female with right primary cream coloured and left secondary cream streaked with brown. Mr. T. H. Grosvenor.

October 3rd, 1911.—*Calamia phragmitidis*, ab. Mr. G. Brooke exhibited a specimen from Wicken with a small striate black spot just below centre of costal streak.—*Melanargia galatea*. Mr. C. P. Pickett a series reared in a greenhouse from Folkstone larvæ; the most noteworthy specimens were: upper sides, males with black markings much increased, males with central area of primaries almost devoid of black; under sides, males with black markings much reduced, two males with black markings much enlarged, and ground colour suffused with blue-black tinge.—*Pieris rapæ*, third brood; from Leytonstone a spotless male, and female with spots coalescent; on the under side the whole brood showed a yellowish ground colour thickly powdered with black scales. *Ibid.*—*Polyommatus phlæas*, abs. Mr. A. J. Willsdon a number of specimens from Deal district, 1911, including two with copper marginal band on inferiors almost obsolete, one with left superior pale straw colour, and a very large specimen with abnormal development of blue spots on inferiors.—*Agrotis ripæ*; early pupation. Mr. F. B. Cross reported that larvæ taken nearly full-fed in August had completed the change to pupæ during September.—Mr. J. E. Gardner recorded having observed an extraordinary number of Lepidoptera attracted to the electric lamps at Amherst Park in July, sixty species being counted round one lamp.—S. J. BELL, *Hon. Sec.*

OBITUARY.

IN the death of DR. SAMUEL HUBBARD SCUDDER (May 17th, 1911) America has lost one of her greatest entomologists, and the science a distinguished votary. Among his greater achievements was that indispensable volume 'Nomenclator Zoologicus,' in which were listed all the generic and family names applying to animals. Publication of this important work was commenced in 1882 and completed in 1884. In 1889 Dr. Scudder published 'Butterflies of the Eastern United States and Canada,' a beautifully illustrated work (three 4to volumes), in which the subject was treated in a novel way, and many changes in generic nomenclature introduced. As Professor Cockerell remarks ('Science,' n. s. vol. xxxiv. p. 338): "Scudder was both architect and builder of his great works, responsible for everything, very rarely seeking collaboration, except for the purpose of gathering materials." As an orthopterist, Dr. Scudder ranked very high; he was also a leading authority on fossil insects.

From 1883-1885 he edited 'Science,' and was editor of 'Psyche' for many years. In 1895 he was elected an Honorary Fellow of the Entomological Society of London.

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THE ENTOMOLOGIST

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DECEMBER, 1911.

[No. 583

LIFE-HISTORY OF *ANOSIA PLEXIPPUS*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

My success attained in working out the complete life-history of *Anosia plexippus* is entirely due to the kind and untiring assistance of the Hon. N. Charles Rothschild, also Dr. A. Skinner, of Philadelphia, and Mr. J. H. Gerould, of Hanover, N.H. To these three gentlemen I offer my sincere thanks.

After repeated failures in attempts made in sending living females of this fine butterfly across the Atlantic, I at last received from Mr. Gerould two females alive, which arrived at 9 a.m., August 8th last. I immediately opened the package, when they at once crawled out with protruding tongues probing about for moisture, whereupon I dipped my finger into sugar and water, upon which one clung for an hour, drinking the whole time. After such a long drink without moving I took it off, but it evidently would have continued its feast longer had I spared it the time. The other also greedily fed on the liquid.

I then placed them both on the only growing plant of *Asclepias cornuti* (milk weed) which survived the hot summer weather, and stood them in the sun, it being a hot cloudless day with a shade temperature of 80° at 11 a.m. By 2 p.m. I found seven eggs were laid, five on the upper and two on the under surfaces of the leaves. Many more eggs were deposited at intervals during the following fortnight, but all those laid by the most perfect specimen proved to be infertile.

The first egg laid at noon, August 8th, hatched at 5.30 a.m., August 12th, remaining only three and three-quarter days (about ninety hours) in the egg state.

It is owing to the very short period of time occupied by the egg that I failed in completing the life-history last year, when Dr. Skinner very kindly sent me a supply of larvæ in different stages, together with a few eggs. These were dispatched from Philadelphia on May 31st, 1910, and reached me on June 7th, consequently by this lapse of time the eggs had hatched and I found a few small larvæ just previous to the first moult. One of

these I immediately figured and described, and subsequently succeeded in working through all stages and bred a fine series of imagines from the various larvæ received, therefore it only remained for me to secure the eggs to enable me to complete the life-history of this remarkable species. As stated above, I accomplished this by the assistance rendered by Mr. Gerould's success in sending me the living females. I will now proceed to describe the various stages.

The egg is conical in shape, closely resembling an acorn in form, but the apex slightly more pointed; it is small in comparison with the size of the butterfly, measuring only $\frac{1}{20}$ in. in height; there are from twenty to twenty-three longitudinal keels (the number varying in different specimens), about fourteen of these run the entire length, from summit to base, the remainder commence about one-fourth from the apex and run to the base; it is ribbed transversely by about thirty-four in number, which extend over the whole surface; excepting the micropyle, which is reticulated with a network pattern.

The colour when first laid is a very pale primrose-yellow, and remains unchanged until the third day when it becomes pearl-white, mottled with yellow and leaden-coloured markings, which first indicate the development of the young larva; it gradually loses the yellow, and a crescent of leaden spots appears on the side denoting the dark feet, and the crown becomes wholly dark leaden colour from the black head showing clearly through the shell.

Immediately after emerging from the egg the larva eats the greater part of the shell, which forms its first meal, usually only leaving the base. It makes its exit by eating away the crown. At 5.30 a.m., August 13th, I watched a young larva feeding on its empty shell; when it had done, it crawled away and found an unhatched egg close by, which it at once started to devour, biting through three of the keels, when I stopped it from doing more damage, and put it on to a terminal leaf of *Asclepias*, upon which it immediately began feeding and soon perforated the entire substance.

Directly after emergence the larva measures $\frac{1}{2}$ in. long; the head is large, black, and shining, with a few fine black hairs, eye spots olive, and mouth parts pearl-grey; the body gradually tapers to the posterior segment which bears a dorsal olive-brown disc; on the second and eleventh segments are pairs of subdorsal olive-brown knobs, and a pair of transverse subdorsal discs on the first segment. Along the body are rows of black bristles, the tips terminate with extremely minute knobs, each bristle is set on an olive-coloured conical base, there are four above each spiracle on either side, and two below, making six in all, one dorsal, two subdorsal, one super-spiracular, and two sub-spiracular; others are placed on the legs and claspers. The segments have four subdivisions.

The ground colour is a pearly-grey with a very slight yellowish tinge in shadows. The second subdivisional wrinkle is light brown, forming a band which gives a ringed appearance to the larva. The surface is covered with minute black granulations; the legs are black, and claspers olive-black and pearly-ochreous.

Before first moult it measures $\frac{3}{16}$ in. long; the ground colour is pearly-ochreous-white with a black stripe encircling each segment. The first larva, which hatched 5.30 a.m., August 12th, moulted first time 6 p.m., August 16th, being four and a half days in the first stage.

Before second moult it measures $\frac{5}{16}$ in. long. The head is now similar in coloration to the subsequent stages, being pale yellow, striped with black; the posterior subdivision of each segment is lemon-yellow, each segment is encircled with a black band; the subdorsal knobs are developed into short tubercles.

One which moulted the first time on the evening of June 8th, 1910, fed at very frequent intervals during both day and night in its second stage, and fixed for its second moult on the morning of June 10th, and moulted the following morning, remaining only two and a half days in the second stage.

The one which moulted first time, August 16th, 1911, moulted second time on August 19th. Another which hatched 6 a.m., August 12th, moulted first time, August 15th, and the second time on the 18th.

Before third moult it measured $\frac{1}{2}$ in. long; all the markings of the subsequent stages are now visible.

The larva which moulted second time, June 11th, 1911, fixed itself for the third moult morning, June 13th, and moulted the third time early morning of the 14th.

After third moult it is $\frac{3}{4}$ in. long. In all respects it is similar in both colouring and pattern to the fully grown larva. The anterior tentacles now measure $\frac{1}{7}$ in. long.

Shortly before fourth moult it measures from $\frac{7}{8}$ in. to 1 in. long; the anterior tentacles now attain $\frac{1}{4}$ in. long. All the colours are clear and defined.

Fourth moult, midnight, June 18th. Its first meal after moulting consisted of its cast skin.

After fourth and last moult fully grown, the larva measures $2\frac{1}{4}$ in. long, the body is of uniform thickness, excepting the rather tapering first and last segments. The head is yellow, with three transverse black hoop-like bands, the central one above the mouth is united below, forming a black \square , the surface is sprinkled with minute fine black hairs. On each side of the second segment is a long subdorsal fleshy velvety-black tentacle, very slender and cylindrical, densely clothed with extremely minute points, and sparsely sprinkled with fine black hairs. These organs project over the head, are slightly upturned and widely

divergent at the tips ; while feeding they are kept in constant motion, generally jerked quickly to and fro. On the eleventh segment is a much shorter pair of similar structure. The ground colour of the body is pale lemon-yellow and white, the white forms a broad median band round each segment ; the segments are striped and banded with velvety-steel-black, the stripes, two in number on each segment from the fourth to tenth inclusive, reach over the dorsal surface down to the spiracle, and separate the white from the yellow. One anterior, and one at the posterior third, between this and the segmental division is a short transverse dorsal streak ; midway between the two larger stripes is a band of the same velvety texture completely encircling the body and enclosing the spiracle, which is also black, above the clasper is a black oblique mark. The black bands extend over the frontal half of each leg and clasper, the posterior half white, the feet of both legs and claspers are shining black. The segmental divisions are broadly black ventrally, tapering to a thin streak dorsally. The entire surface is sparsely sprinkled with extremely small clubbed bristles with dark bulbous bases. These are only visible under microscopic power.

The larva appears of very docile temperament, if I may use the term, as they take but little notice of being disturbed, and if touched while feeding they merely stop for a few seconds and then continue, and are quite content to feed in any attitude they may be placed in ; their only object is to be almost continually feeding, consequently they rapidly grow.

The larva described which moulted midnight, June 18th, became fully grown and stopped feeding on the evening of June 23rd ; it spun up, attaching itself by its anal claspers to a pad of silk spun on the leaf stalk, on the following morning, and pupated the next morning, June 25th.

Another fully grown larva ceased feeding on June 8th ; after roaming about for six hours it spun a silk pad on the gauze covering, and suspended itself and pupated the following evening, June 9th. The next morning the colouring of the pupa had matured. The first two which hatched, August 12th, 1911, became fully grown and stopped feeding on the afternoon of August 26th, and roamed about for many hours. They both suspended themselves the following afternoon and pupated the next afternoon, August 28th, having remained in the larval state sixteen days.

The pupa measures 1 in. long, including the cremaster, and is $\frac{1}{2}$ in. wide across the middle of the abdomen ; it is proportionately stout for its length, rounded and remarkably smooth, having no angles or projections. The abdomen is conical and terminates in a stalk-like cremastral process, the whole form producing a beautiful pendant object, especially when viewed either dorsally or ventrally, and from its smoothness, colouring, and general

structure it resembles a finely modelled jade ornament encircled and studded with highly burnished gold, rather than a living object.

Lateral view: head blunt and slightly rounded, forming a continuous curve with the meso-thorax; the meta-thorax and first three abdominal segments form a straight inclined line, the abdomen then curving to apex, which terminates in a long shining black cremaster amply furnished with a cluster of black hooks at the extremity, the ventral surface of abdomen rounded, it then runs in a straight line from apex of wings to head.

The posterior edge of the third abdominal segment is beautifully adorned by a dorsal belt reaching to the hind margin of the wings, the knobs of which are tri-coloured; the front edge is intensely black and shining, the hinder half of highly polished nacreous splendour, reflecting the intensely brilliant gilded band on which they are situated; there are six other equally brilliant gilded discs running in an oblique line on each side from the head to the surface of the meso-thorax and one in the disc of wing. In the posterior centre of the anal segment is a medio-dorsal black spot, a pair of black points on the ventral surface, and two black markings running from the cremaster; the spiracles are slightly raised and whitish. The entire structural details are very inconspicuously outlined; the abdominal segments from the third are very narrow, producing a stunted rounded cone. The whole ground colour is a pale glaucous-green; for the first few hours after pupation the colour is a deeper yellow-green and the ornamentations opaque yellow. It is very firmly attached by the cremastral hooks to a small but dense pad of silk.

The first one, which pupated on June 9th, 1911, began to show signs of emergence on June 22nd, by the thorax becoming changed to a duller leaden-green. It gradually turned duller all over and finally became uniformly of a leaden hue, but the gold ornamentation still retaining the brilliancy, and the markings of the imago appeared on the morning of the 24th, and it (a female) emerged at 3 p.m. that day, remaining fifteen days in the pupal state. The imago was fully developed in twenty minutes after emergence.

The descriptions of the colouring of the egg and larva in first stage, given by Scudder in his 'Butterflies of New England,' p. 724, and copied by English authors, do not agree with either the eggs or young larvæ which I had under observation.

Scudder describes the egg as "very pale amber-green, becoming greyish before hatching." All the eggs I obtained showed no green at any stage of their existence; all were very pale primrose-yellow from the first (as I saw some being deposited), and remained unchanged until shortly before hatching when they became still paler. The egg is also stated to be "long and oval in shape." The same author also says the larva in

first stage has the "body pale green"; this is certainly misleading, as in no period of its first stage is any green visible. It is pearly-grey, or cobweb colour, when first hatched, and remains almost unchanged, excepting becoming even paler until after its first moult.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. GEORGE WHEELER, M.A., F.E.S.

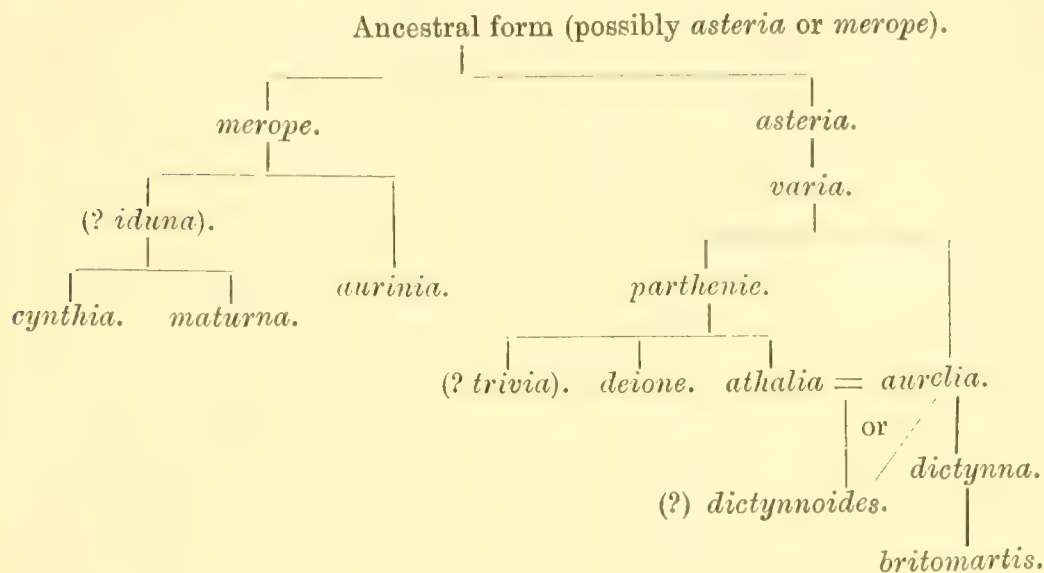
(Concluded from p. 267.)

THERE is one further point with regard to this group which is of great interest, and to which my attention has been turned throughout the time during which I have been studying it, *viz.* its phylogeny, and I have delayed treating of the subject in the hope of being able to come to some definite conclusion. The whole question is, however, so complicated, and the evidence available seems in some respects so contradictory, that I can do little more than throw out suggestions which may possibly be of use in the future, if only as a basis for criticism.

The group consists of a number of ill-defined species, some of which are widespread, some local, and it is equally possible to argue that the latter are the most ancestral forms which have in most places been superseded, or the most recently developed which have not yet spread themselves widely; other considerations seem to show that both arguments are true, and that in different cases the local restriction of species must be referred to opposite causes. In this group, for instance, it is probable that *asteria* and *varia* are ancestral, *deione* and perhaps *dictynnoides* (geologically speaking) modern species. For, in a group like the Melitæids, which are to be found at the extreme heights of latitude and altitude, especially when the same statement is true of the nearly related Brenthids (and most true of the most nearly related forms), it seems probable that the ancestral forms of the group were capable of resisting the cold of the last glacial epoch, and have spread themselves downwards both in altitude and latitude, the oldest forms being those capable of enduring the greatest amount of cold, and the most recent those which are found in the warmest localities inhabited by any members of the group. There may, however, always remain an inherited tendency towards the power of supporting cold, which would enable forms of southern origin to spread northward, as *deione* seems disposed to do, and lowland forms to mount upward, as may possibly be the case with *athalia* and *parthenie*, and even with *dictynna*.

In a group consisting of well-defined species it would no doubt be rash to suggest the direct descent of one existing species

from another, but where the species are so ill-defined as in the present group, it appears to me not unreasonable to suppose that this may be the case; yet it is with the utmost diffidence that I hazard the suggestion of the following table, in which doubtless there are many "missing links," and which fails to account satisfactorily for the origin of the *cinxia* group, which is almost certainly, however, the most modern of the three:—



Such a table as this does not of course attempt to give, or even to hint at, the periods at which the evolution of different species began in comparison with each other; for instance, although I think it possible, and even probable, that *deione* and *athalia* had a common origin in *parthenic*, yet I have no doubt that the former is a vastly older form than the latter; the suggestion indeed that *parthenic* is an older form than *athalia*, still more that it is the direct ancestor of the latter, needs explanation. *Athalia* then is the most unsettled form of all in this group, and compares only with *aurinia* in this respect in the elder, though it is exceeded by *phæbe* and *didyma* in the younger group. There are, in fact, scarcely two localities in which this species is quite alike, and in all probability it will split up in the course of ages into many species, some of which will no doubt persist while others will become extinct. It is the extreme want of fixity in this species that first suggested to me the probability of its comparatively modern origin; its connection with *parthenic* is obvious, but it is equally obvious that the connection of *parthenic* with the exclusively high-level (and therefore ancestral) form *varia* is closer than that of *athalia* with the same species, which is a further hint that the latter is the less ancient of the two. It may be fairly replied that such a position is inconsistent with my view that the more southern are the later forms, since *parthenic* is to be found further south than *athalia*. If,

however, I am correct in my supposition that the group spread *downwards*, the single-brooded form of *parthenie* will be the older, and I take it that, when the evidently aggressive *athalia* became separated from it, the parent stock was forced to extend its southward range. Here it would be able to emerge earlier in the year, and gradually a double-brooded habit might be formed; as *athalia* advanced further south it would interfere less with *parthenie*, its single brood coming between the two broods of the latter, though *parthenie* would still be urged further southward, to a point to which *athalia*, with its still single-brooded habit, has not yet been able to follow it. It is significant that where the two species are both common, the one is single- the other double-brooded. Where both are single-brooded, *parthenie* is always scarce. The single-brooded habit of *athalia* may probably have been confirmed by the fact that its usual food-plant, Scabious, does not provide food for the hibernated larva till considerably later than that of *parthenie* (plaintain). *Deione*, in the form of *berisalensis*, on the other hand, I imagine to have been evolved from *parthenie* much later, and when and where its double-brooded habit was confirmed. The fact that it has accustomed itself to a food-plant (*Linaria*) which, so far as I am aware, *parthenie* never touches, would preclude any considerable interference of the one with the other. With regard to Caradja's theory that this species arose originally as a hybrid between *phæbe* and either *athalia* or *parthenie* ('Iris,' vi. p. 181), supported (?) by his statement that he has taken it paired with each of the latter species, and possesses "undoubted" hybrids, I would only remark that a few lines further on he accounts for the darker *athalia* of the mountains as being "doubtless" hybrids with *parthenie*, and that in most Pyrenean localities *parthenie* and *deione* are by no means easy to distinguish, while in others the latter bears on the upper side a decided resemblance to the *athalia* of the same localities. The strongest argument for the close common origin of *parthenie* and *aurelia* is the very striking resemblance of their larval and pupal stages, though the ova are more easily distinguished. Of the origin of *dictynna* I feel far more uncertain; that its affinities are rather with *aurelia* than with any other known species admits, I think, of no doubt, and the affinities of the Oriental *plotina* with both add probability to the nearness of the relationship. *Britomartis* may possibly be its immediate parent or its immediate descendant. In the former case it has been almost completely ousted by its descendant; in the latter its double-brooded habit would be a purely southern and comparatively modern development. In 'Iris,' vol. xi. p. 9, Hormuzaki has a most interesting disquisition on the phylogeny of *dictynnoides*, discussing the comparative possibilities of its being an ancestral or a modern form. He also propounds the theory, which he seems disposed to

adopt, that it may have been a hybrid form between *athalia* and *aurelia*, not, as he carefully points out and conclusively shows, a direct hybrid, but the descendant of parents of hybrid origin. Recent experiments have shown that such a descent is possible, though it was long imagined to be otherwise, and it cannot be rejected offhand; but its affinities seem rather with *aurelia* than with any other species. It is exclusively an eastern species, the Tatra apparently being its western limit, but I am far from certain that it—or something like it—was not intermediate between *aurelia* and *dictynna*, the latter form arising very early in the history of *dictynnoides*, and spreading west, north, and south, whilst the latter spread east, and became the parent of some at least of the Asiatic forms related to *aurelia*. If it be held that the wide distribution in Western Europe of *dictynna* precludes this possibility, I shall not quarrel with that view; and, indeed, the data are far too fragmentary to serve as a basis for anything beyond the merest hypothesis.

It will be noticed that I have barely touched upon any Oriental forms, my reason being that the very slight knowledge which is obtainable on these species fails to throw any light on the general subject, and indeed only increases the confusion. When more information on these is available, it will be worth while to attack the subject again.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 340.)

(iii) *The Marshland of Gironde.*

PASSING over for the present, as outside the limitations of these papers, the entomological results of three weeks' sojourn in the Central Pyrenees, I propose to give a short account of flying visits to the Gironde and the Charente-Inférieure, which will, I hope, interest my brother collectors who contemplate breaking away from the trodden paths to investigate the rich fauna of these western Departments, apparently unworked also by the majority of French collectors of the present day.

After our butterfly-hunt in the lowlands round Biarritz, and in the Western and Central Pyrenees, I found myself alone in Bordeaux on the evening of Monday, July 31st. The thermometer stood at something like 90° in the shade, and the great city, perfumed with the scent of a thousand magnolias, built as it is largely of white stone, refracted the last rays of a tropical sun. My aim

and object there was to discover *Chrysophanus dispar* var. *rutilus* in one of the very few regions of France where it is known to survive, and, as subsequent events came about, I was to be by no means unsuccessful in my quest. I may say at once, however, that without the kind assistance, willingly given, of a French lepidopterist—the veteran M. Robert Brown, of Cauderan (who some years ago had given me invaluable information about the butterflies of the south-west)—I could by no possibility have found my way to the particular *terrain* still consecrated to the loveliest and rarest of western “Coppers.”

The localities in the near neighbourhood of Bordeaux, specified for *rutilus* (= *hippotoë*, L.) by M. Charles Oberthür in his quite recent ‘*Lépidoptérologie Comparée*’ (fasc. iv. pp. 137–155, &c.), have already disappeared. The “marshes” of Baccalou are now part and parcel of the city open spaces—drained dry, and overrun with humanity; and it is necessary, therefore, to go further afield to find *rutilus* at home. Half an hour’s journey by tram to Cauderan on August 1st—a cloudless, brilliant morning—brought me to M. Brown’s house, where I found my friend awaiting me, and prepared to take the field at once, he having already explored certain old-time haunts of the species only to draw these “coverts” blank. Once more we took to wheels: this time the tram which leads to Le Vigean and Blanquefort—outlying villages—and passes rapidly from suburban villadom into the network of market-gardens which in this direction have invaded the former marshland. We alighted at an opening between two such highly cultivated pieces of land in the neighbourhood of Bruges—a name so suggestive of the Low Countries that I at once asked my companion the meaning of this Flemish-sounding appellation in the midst of a Department which deals chiefly in “acs” and “ocs”—Pessac, Medoc, and the like. His reply was instructive, not only etymologically, but entomologically. Some two hundred years ago the “Grand Monarque,” recognizing the possibilities of the soil, composed of detritus brought down by the great rivers from the Pyrenees, colonized the then existing “landes” with Netherlanders as being the most experienced and expert reclaimers—then as now—of such localities. The experiment succeeded. The “landes” were reclaimed, and the process of absorbing the marshes into cultivation still goes on, to the inevitable destruction of all indigenous beasts, birds, and insects—not least of these, *Chrysophanus rutilus*! The same forces, then, which destroyed the “Large Copper” in the Cambridge and Huntingdon fens are in full swing here, and the final extermination of this butterfly over most of the Bordeaux country is but a question of near time.

Pursuing our way down a sandy cart-track, hemmed in between prosperous-looking fruit-farms—a track lined until re-

cently with wet alluvial deposit, and haunted by marsh Lepidoptera—we came in about twenty minutes to a level railway crossing, a few minutes beyond a large farmhouse where entire poplar avenues had been laid low by a recent hurricane, and hereabouts M. Brown informed me I might hope to set eyes on my quarry. Hitherto, beyond swarms of *Epinephele tithonus*, a very small form of *Melitæa parthenie*, and one or two *Celastrina argiolus*, with a single battered *Iphiclides podalirius*, we had seen nothing worthy of a box.

But at this point we entered an unreclaimed fen extending for about a quarter of a mile, narrow in width, but essentially primitive land, with broad ditches dividing it from fields on one side, and the road on the other. I had hardly unpacked my net when the unmistakable glint of copper wings announced us on the right ground, though this proved to be no more than a single stray male from much further on. The sight of occasional heads of the Great Water Dock among many other familiar aquatic plants, punctured and caterpillar-eaten, gave promise of further success; while the whole inland area, entirely dry after the prolonged drought, teemed with butterfly life. *Polyommatus icarus*, a fine bright form; *Loweia dorilis*, small and rather wasted; *Everes argiades*, even more dwarf, *Pyrgus sao*, *Melitæa cinxia*, and *M. parthenie* disputed possession of the fleabane flowers and frequent spires of purple loosestrife, on which also *Lampides bœticus*—a very common “blue” about Bordeaux—disported with *Colias edusa* (I missed a fine ab. *pallida*, Tutt), *Pyrameis cardui*, and other Vanessids. But, the sky becoming momentarily overcast, it was not until the very end of the marsh was reached that I began the chase for *rutilus* in earnest. The few males on the wing at this point were getting worn; the females, rare but in good condition: both sexes very small.

After returning for *déjeuner* to Le Vigean, exploration of the swampy fields further on and a walk back late in the afternoon to the Blanquefort-Bordeaux tramway by the banks of a little river resulted in the capture of some ten or twelve more examples. But I had now all the indications I required, and next day I started work alone at the furthest field from the marsh, whence I was speedily ejected by an excited farmer, though what possible harm I could be doing in all that tangle of weeds, of which his pasture (!) consisted, beats my comprehension. My mild baritone invective was, however, no match for the terrific tenor patois which distracted that good man's vocal chords; and I bowed to the storm. Undisturbed in this same waste the day before, I had come upon two *rutilus* larvæ, one quite small, the other in the last instar, suggesting a somewhat prolonged emergence, though not a few females were already wasted. I handed over these larvæ to M. Brown to

rear, my chances of securing food-plant during the next fortnight's travel being altogether hopeless.

The headquarters of *C. var. rutilus*, hereabouts, I soon found to be in the low-lying fen, and on the banks of the stream between the Bruges and the Le Vigean-Blanquefort road. On August 2nd males and females were in abundance—rather larger, and both sexes in better condition; while at one point, where the brown peaty water falls over a little weir, and provides an agreeable bath for the lads of the district, I had the extreme pleasure of observing no fewer than eighteen males and six females on a single plant of *Inula dysenterica*.

This Blanquefort locality was known evidently for many years to local collectors of a past generation, but M. Brown informed me that for the moment lepidopterists are scarce in Bordeaux. I find in Trimoulet's 'Cat. des Lépid. de la Gironde' (Bordeaux, 1858):—"Hippothoë, L., June and August. In the marshes on *Inula dysenterica*. At Blanquefort, Bègles, Couregean, &c. Larva in April and June on *Iris pseud-acorus*"—surely a mistake, even if *hippotoë*, Hb., be not the "Copper" intended—as I am sure it is—because *hippotoë*, L. (= *chryseis*, Hb.) does not occur in Gironde, and M. Brown told me that he had himself introduced the late M. Trimoulet to these haunts of *rutilus*. The butterfly, as we have seen, still affects the fleabane. Tutt has collected the various food-plants ('British Butterflies,' vol. i. p. 448), and, with the exception of *Polygonum bistorta*—on the authority of Heyne—they are without exception species of *Rumex*. If Trimoulet had said that the imago rests on the *Iris*, I could have endorsed his evidence, for, when the sun was temporarily clouded, I noticed several females sitting on the flag blades, probably conveniently near to the *hydrolapathum*, of which there was plenty in all the ditches and at the edge of the river.

Looking over the series in my cabinet, I find very little variation in the males. They differ chiefly in the degree of visibility of the under-side marginal and antemarginal spots of the hind wings showing through. In the females, which display a considerable difference of size, ranging from about 33 mm. to 40 mm., the tendency to dark suffusion of the hind wings upper side is most marked, while the antemarginal black spots on the fore wings range from light inconspicuous to heavily accentuated dots.

I can only regret that my time should have been necessarily limited to two days, or rather a day and a half, at Bordeaux. The country round is varied, and the lepidopterous fauna rich. Another year I hope I may have the good fortune to be going south in this direction in June, when the first and finest emergence of *rutilus* takes place, the butterfly then being in size no whit inferior to our long defunct and lamented *C. dispar*.

BUTTERFLIES OBSERVED: ENVIRONS OF BORDEAUX (GIRONDE), AUGUST 1ST AND 2ND.—*Carcharodus alceæ*; *Pyrgus sao*; *Nisoniades tages*; *Chrysophanus dispar* var. *ruscelus*, *L. dorilis*, *R. phleas*; *Nomiades semiargus*; *Polyommatus icarus*, *P. medon*; *Plebeius argus* (ægon); *Everes argiades*; *Celastrina argiolus*; *Lampides bertius*; *Iphiclides podalirius*; *Pontia daphidice*; *Colias hyale*, *C. edusa* (and ab. *pallida*); *Gonepteryx rhamni*; *Issoria lathonia*; *Melitæa cinxia*, *M. parthenie*; *Pyrameis cardui*; *Aglaïs urticæ*; *Epinephele tithonus*; *Pararge megæra*; *Cœnonympha pamphilus*.

(To be continued.)

A REVISED LIST OF THE BRITISH ANTS.

BY HORACE DONISTHORPE, F.Z.S., F.E.S.

I HOPE shortly to publish the distribution of the ants which occur in Britain, as far as is at present known. It seems to me therefore desirable first of all to publish a list of our species in the proper order and with the correct synonymy.

It is also necessary to place on a proper footing the different species, subspecies, and varieties. Three of the varieties and one subspecies have been added within the last two years, and it is probable that when more attention has been given to our ants, and more collecting has been done, several other species or forms will be found to exist.

I use the term "subspecies" instead of "race," as the former is more generally employed now by myrmecologists, though I think perhaps Prof. Forel's word "race" is more expressive.

The difference between subspecies and varieties in ants is only one of degree. The former is more constant, nearer to the species; the latter exhibits more hybrid forms and transitions.

The following is our list:—

FORMICIDÆ.

Subfamily PONERINÆ.

Genus PONERA, Latr.

coarctata, Latr. (*contracta*, Latr.).

punctatissima, Roger.

Subfamily MYRMICINÆ.

Genus MYRMECINA, Curt.

graminicola, Latr. (*latreillei*, Curt.).

Genus FORMICOXENUS, Mayr.

nitidulus, Nyl.

Genus SOLENOPSIS, West.

fugax, Latr.

Genus MYRMICA, Latr.

- | | |
|--------------------------|---------------------------|
| <i>sulcinodis</i> , Nyl. | <i>scabrinodis</i> , Nyl. |
| <i>laevinodis</i> , Nyl. | <i>lobicornis</i> , Nyl. |
| <i>ruginodis</i> , Nyl. | |

Genus STENAMMA, West.

- westwoodi*, West.

Genus LEPTOTHORAX, Mayr.

- acervorum*, Fab.
tuberum, Fab., subsp. *nylanderi*, Först.
 „ „ „ *corticalis*, Schenck.
 „ „ „ *unifasciata*, Latr.

Genus TETRAMORIUM, Mayr.

- cæspitum*, L.

Subfamily DOLICHODERINÆ.

Genus TAPINOMA, Först.

- erraticum*, Latr.

Subfamily CAMPONOTINÆ.

Genus LASIUS, Fab.

- fuliginosus*, Latr.
niger, L.
 „ subsp. *alienus*, Först.
flavus, Fab.
umbratus, Nyl.
 „ subsp. *mixtus*, Nyl.

Genus FORMICA, L.

- rufa*, L.
 „ var. *alpina*, Santschi.
 „ var. *rufo-pratensis*, Forel.
 „ subsp. *pratensis*, Deg.
sanguinea, Latr.
exsecta, Nyl.
fusca, L.
 „ var. *glebaria*, Nyl.
 „ var. *rubescens*, Forel.
 „ var. *fusco-rufibarbis*, Forel.
 „ subsp. *rufibarbis*, Fab.
 „ subsp. *gagates*, Latr.

With regard to some of the changes in the above list, I may mention I have placed the Ponerinæ at the beginning of the list because they are the most primitive of all the subfamilies of ants. In the genus *Myrmica* I have treated them as species, which I have always regarded them to be, instead of subspecies, and Prof. Wheeler refers to them as “the closely allied species,

scabrinodis, *lævinodis*, &c., which were formerly regarded as mere subspecies" ('Journal New York Ent. Soc.' xix. 1911, p. 163).

The varieties of *Formica fusca*, L., have been quite inaccurately dealt with in this country. It is impossible to tell if the various records of *rufibarbis* and *cunicularia* really refer to the subspecies *rufibarbis*, F., or one of the vars. of *fusca*. (*F. cunicularia*, Latr., is really a synonym of *rufibarbis*, F.) The var. *fusco-rufibarbis* is very abundant at Whitsand Bay, and all the ants in some of the nests are of a very dark colour, being intermediate between lighter *fusco-rufibarbis* and *glebaria*. The former lives chiefly in the sand on the borders of rivers, lakes, and by the sea; the latter in the earth on the plains. *F. fusca* is more common in woods. Forel says that *glebaria*, *rubescens*, and *fusco-rufibarbis* have more the habits of *F. fusca*, and are not so warlike as *rufibarbis*. On the other hand, I have found the var. *fusco-rufibarbis* is not nearly so cowardly an ant as *fusca* proper, and Crawley tells me this is his experience with *glebaria*. The var. *fusco-rufibarbis* is very silky (with silvery pubescence), darker than *rufibarbis*, the back of the thorax brown, less polymorphic, and much less hairy, especially on the thorax. It resembles *rubescens*, but is more pubescent and less red, more red, however, than *glebaria* as a rule.

It is of interest to notice that the myrmecophilous beetles, *Atemeles paradoxus* and *Dinarda pygmæa* occur with *fusco-rufibarbis* and not with *fusca* proper; the known distribution of both species in Britain being almost confined to the seaside (the first having been found in the Plymouth district, Weston-super-Mare, Isle of Wight, Folkestone, Bournemouth, &c., and the second in the Plymouth district and at Weston-super-Mare), as might be expected from the habits of the *Formica* hosts. Of the former genus, *Atemeles emarginatus*, on the other hand, is only found with *fusca*, and not with its subspecies or varieties; the winter hosts of both *Atemeles* being species of the genus *Myrmica*.

FORMALIN A REMEDY FOR MOULD ON CABINET SPECIMENS.

By W. G. SHELDON, F.E.S.

It is now some thirty-five years since I was informed by the late John T. Carrington that the best remedy for mould on cabinet specimens was "glacial carbolic acid," and from that day until about a year back I used it exclusively for that purpose.

The treatment proved fairly successful until I came to reside in my present house some seven years ago; but in consequence I suppose of the house being a new one, and the walls being full of damp, mould commenced to appear extensively in my collec-

tions; and although frequent applications of carbolic acid kept the fungus down, I could not get rid of it.

About a year ago, whilst showing some drawers of my European butterflies to a medical friend, I pointed out to him a fine specimen of *Apatura iris*, the thorax of which was covered with mould.

My friend advised me to use "formalin" which, he stated, he believed to be absolutely fatal to all such growths. I took his advice, with the result that every trace of mould vanished within a few days from my cabinet drawers, and up to the present date there has not been the slightest return of it.

My method is very simple: I pour out a small quantity of formalin into a saucer, stick a wad of cotton-wool on the head of a pin, immerse it in the formalin, and then stick it in the drawer, which must be closed immediately. After a few days the pin and cotton-wool can be removed and the cure is complete. I have not found the slightest damage to a single specimen result from this process.

I was particularly struck with the result of the remedy on a box of large Chinese *Sphinges* which had been kept in a damp cupboard, and which were in consequence a mass of mould. A few days after treatment with formalin the fungus was not only dead but withered away.

I have made a number of enquiries amongst entomological friends, but cannot find anyone who has used formalin for mould; I am therefore sending this note. Probably there may be some who have used it, and, if so, their experiences, which may possibly have extended over a longer period than mine has done, would be interesting.

Youlgreave, South Croydon: October 21st, 1911.

ON SOME RECENT ATTEMPTS TO CLASSIFY THE COLEOPTERA IN ACCORDANCE WITH THEIR PHYLOGENY.

BY C. J. GAHAN, M.A.

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(Concluded from p. 351.)

THE *Eucnemidæ* and *Throscidæ* are without doubt closely related to the *Elateridæ* and *Cebrionidæ*, and should be associated with them in the same minor group, either as derivative forms, or as collateral descendants from the same ancestors. The *Dicronychidæ*, recognised by Koble as a family, are only distinguishable from ordinary *Elateridæ* by having somewhat remarkably modified asymmetrical male genitalia, and a peculi-

arity in the structure of the tarsal claws. But the Cerophytidæ are very distinct, and their relationship to the Elateridæ is much more remote; so that, if they are to be included in the same group, it is only because they possibly may be a divergent offshoot from the ancestral stock.

The Buprestidæ are in many ways a highly specialized family of beetles, and cannot be ancestral to any of those just named. But at the same time, although it is possible, it is very difficult to see how they can be derived from any of those Elateroid families, the differences being so great, and the connecting links nowhere among existing forms to be found. So far I agree with Lameere. But to me it is equally difficult, and for the same reason, to see how they can be derived from the Dascillidæ. I look, then, upon the Buprestidæ as a very isolated family, whose origin is almost as much of a problem as is that of the Lamellicorns or Longicorns. The wing-venation in this family is quite characteristic, easily distinguishable from that of other beetles, but not very easily to be derived from that of any other family: (1st) the median vein (M_2) has moved forwards towards the radius, and its short recurrent branch comes off at a considerable distance from the apex of the wing; (2nd) the recurrent branch (R_2) of the radius (R_1) lies very close to the latter, leaving only a very narrow cell between; and (3rd) the cubitus appears to have four longitudinal branches, three of them in a position to correspond with the two marked Cu_1 in my figure of the Lampyrid wing on p. 125, the fourth homologous with Cu_2 of the same figure. The cell between Cu_2 and A_1 is generally complete, and then somewhat elliptical in form, with only a single vein continued from it to the margin of the wing, and this vein might be interpreted as A_1 instead of Cu_2 , if we did not find both often continued up to the margin, while the anterior three branches are at the same time present. The modifications undergone in the fore part of the wing are not unlike those met with in the Lamellicorns, and might easily enough be explained as derived from the Elaterid or Dascillid type. But it is less easy to account for the additional vein in the cubital area. It may possibly have arisen from the conversion of a vein originally transverse into a longitudinal one, which then further develops; it may be due to the bifurcation of an originally single branch, or it may be an inheritance from some ancestor in which the cubitus had four longitudinal branches. If we accept as correct either of the first two alternatives, then the Buprestid wing may without much difficulty be derived from the Elaterid or Dascillid wing; but if we consider the last of the three as the most probable explanation, we must look for the origin of the Buprestidæ elsewhere.

The male genital organs have been investigated in only a few species of Buprestidæ, and not yet, so far as I know, in any

species of Dascillidæ. Their structure in the Buprestidæ is somewhat remarkable, and constitutes what might almost be regarded as a distinct type. Each testis, as described by Léon Dufour in the genus *Coræbus*, consists of five very long, slender, tubular capsules, which, arising from the dilated end of the vas deferens, are intricately coiled up together in a mass, from which their ends emerge, terminating each in a slight oval swelling. In another Buprestid (*Anthaxia manca*), investigated by Laboulbène, there are six spermatie capsules, which are swollen and somewhat fusiform at the base where they join the efferent duct, and then taper out into long fine tubes, which are coiled together and run into one another, their ends not being free as in the preceding case. It would be interesting to find out not only how far this type of structure occurs in the Buprestidæ, but whether it is to be met with also in any other family. The only other beetles I know of in which the structure is at all similar are the Cleridæ.

In another respect also the Buprestidæ call for some remark and further inquiry. The Malpighian vessels, which in most other families, and even in whole groups, are tolerably constant in number, either four or six, are in this family not at all constant, but appear to be nearly as often the one number as the other. Out of seven species, investigated by Dufour and Laboulbène, four were found to have six Malpighian tubes and the remaining three only four. In the larvæ he dissected, Dufour found six of these vessels, and not knowing at the time that any Buprestid imago had six, he was led to infer that the larvæ of Buprestidæ had six and the beetles only four Malpighian tubes.* This would be a surprising fact, if true. But the inference was wrong, and the probability is, as Laboulbène said, that larva and beetle have, in the case of each species, the same number of vessels.

From these different facts I have mentioned concerning the Buprestidæ, it is evident that there is much still to be done before we can finally decide what place that family should take in the ranks of the Coleoptera.

Having but a very limited knowledge of some of the families included in the Dascilloidea of Kolbe, I can hardly venture to go further in the way of criticism than to point out that there is some room for a difference of opinion in regard to the composition and validity of the group. This is evident from Lameere's treatment of the same series of families. He has placed some of them with the Elateroids and Buprestidæ in his group Sternoxia. For the Psephenidæ, Dryopidæ, and Helmidæ he makes a separate group—the Macroductylia. And he

* Hence, probably, an error, which appears on p. 355 of Packard's 'Text-book of Entomology.'

associates together the Dermestidæ, Byrrhidæ, and Nosodendridæ in another group—the Brachymera.

Coming next to a consideration of the Clavicornia, we find Kolbe in much closer agreement with the views of Lameere although here also there is the slight difference, already noted—the inclusion in the group by Lameere (but with doubt) of two families, the Cioidæ and Sphindidæ, which Kolbe places in the Bostrichoidea; and there is this further and important difference, that Kolbe places the Clavicornia after, not before, the Heteromera. If I had to accept the Clavicornia as a distinct and separate group, independent in origin from the rest of the Diversicornia, I certainly should side with Kolbe in placing them after the Heteromera. There are no doubt points of resemblance both amongst the larvæ and the adults, suggesting a somewhat close affinity between the Heteromera and the Clavicornia, but I consider the latter to be on the whole a more highly specialized group, and one of minor value, that might readily enough be derived from some other of the Diversicornia.

The Heteromera show a considerable amount of diversity in their structure, and it has been suggested, perhaps more than once, that they are not really a natural series, and might be better placed, scattered among various other groups of Coleoptera. That heresy, I am glad to say, has met with no favour from any one of our three authors. They agree to look upon the Heteromera as a perfectly natural and monophyletic family series. In no other way, except as derived from a common ancestor, can they explain the complete disappearance of the missing segment of the hind tarsus, a character met with in every member of the group without a single exception. That character, moreover, does not stand alone, for an intimate study of the different families included in the group tends to show that the view as to their common relationship is on other grounds also well justified. But at what period in the history of the Coleoptera did the first Heteromeron appear? Were the Clavicorns then in course of being differentiated into a group such as we now know them? It is extremely doubtful; and I know of no ancestral feature exhibited by the Clavicorns that would lead us to consider them of earlier origin than the more primitive of the families of Heteromera. The genus *Phrenapates*, between which and some of the more primitive Clavicorns my friend Lameere finds points of affinity, has no right to be regarded otherwise than as a highly specialized form of Heteromeron, and the family to which it belongs—the Tenebrionidæ—no claim whatever to the first place in the family series. In his suggested arrangement of the families in this series, Lameere is considerably at variance with Ganglbauer and Kolbe, and my own opinion in the matter is that his arrangement is wrong, and that the course of develop-

ment within the group was almost quite the reverse of that suggested by him.

I have now dealt with the three classifications in all but their least important points, and I hope I have given no unfair representation of the views held by their authors. From the criticisms which I have ventured to offer as I went along it will be evident that my own views on the phylogeny of the Coleoptera are in more or less complete accord with those of Ganglbauer. His classification, it is true, is not altogether satisfactory, because it leaves us still somewhat in doubt as to the origin of certain of the groups, but in the present state of our knowledge it could hardly have done otherwise. We may in course of time be better able to see how the Phytophaga and Lamellicornia have been derived. If we are to attach great importance to the pedicellate structure of the testes, common to the two groups,* and believe that it could not have been acquired independently by each, we must look for the origins of both groups very near one another. That they were near one another in any case seems quite probable, and it is only a question with me as to which was the later of the two, and which therefore should come last in the classification.

I think it possible also that the Heteromera, instead of being derived directly from the Protocantharideon, may have branched off at a very early date from the common stem of the Diversicornia—that the Diversicornia and Heteromera may have gone together a little in one direction, the Phytophaga and Lamellicornia together in another, before the final differentiation into the four groups took place. Of these four groups, the Diversicornia, in their lowest forms the Malacodermata, seem to have retained most of the ancestral characters; and the Lamellicornia, taking them as a whole, seem to be the most modified. The Rhynchophora are indeed, as Kolbe maintains, another highly modified group, and if there were no such group as the Phytophaga existing, to which they show so close an affinity, they might very well be placed after the Lamellicornia. All things considered, I agree, then, as in most other points, with the order in which Ganglbauer has arranged the groups, and I think that his classification may well stand for the present as the one best devised to express our knowledge of the phylogeny of the Coleoptera.

* Since writing the footnote on p. 169, I have ascertained from dissections made by myself, and also by Mr. F. Muir, that the testes of *Timarcha* are as described by Dr. Bordas, and of a different type from those of other Phytophaga—a fact which is somewhat disconcerting.

ERRATA.—In the last paragraph on p. 124, and the first two on p. 125, for M_2 read M_1 . In the last paragraph on p. 349, and the last on p. 350, for Dascillidæ read Dascilloidea.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By FRED V. THEOBALD, M.A., F.E.S., &c.

(Continued from p. 356.)

Aphis solani, Kaltenbach.—Wye, June 26th, 28th, July 7th, 1911, a few apterous females beneath potato leaves, and a single winged female on June 28th.

A. tragopogonis, Kaltenbach.—On *Tragopogon pratensis*, Wye, August 12th, 1911, and Herne Bay, July 18th, 1911, and on *Schorzoneria* at Wye and Herne Bay, July 15th and 20th, 1911.

A. cratægiella, nov. nom. for.

A. cratægi, Buckton (non Kaltenbach).—Common on the top shoots of hawthorn in hedgerows, Wye, and Godmersham, forming large dense colonies, May 22nd and 29th, June 7th and 10th, July 1st and 18th, September 20th, 1911. One apterous female had black cornicles. Kaltenbach's *A. cratægi* is black, Buckton describes and figures a green species which is quite distinct. The two species I have twice found together.

A. malvæ, Koch.—A few apterous females on the leaves of the dwarf mallow (*Malva rotundifolia*) in Wye churchyard, August 22nd to 27th, 1911. Apparently rare.

A. lappæ, Koch.—On cultivated celery, sometimes freely on the leaves, at others in masses hidden between leaf stalks, Wye, September to November, 1907; also sent me from Ely in September, 1909.

A. cratægi, Kaltenbach (non Koch, non Buckton).—Wye, on hawthorn, May 29th, September 12th, 1911; also from Haddenham, Cambridgeshire.

A. ochropus, Koch.—On *Rumex*, Wye Downs, July 30th, 1911, a single dense colony of winged and wingless females and nymphs.

A. ilicis, Kaltenbach.—On holly leaves, Wye, a few scattered wingless females; also found at Hastings, May 3rd, 1911, a single colony on a leaf.

A. craccæ, Linn.—A few wingless females on *Lotus corniculatus*, along Olantigh Road, Wye. This appears to be the *A. vicie* of Fabricius.

A. opima, Buckton.—Wye, on begonias, March 27th, 1903, under glass.

A. atriplicis, Buckton (non Linn.).—The only black aphid I have found on mangolds, and which has swarmed and done enormous damage this year, answers to Buckton's description of his *A. atriplicis*. It is, however, apparently only *A. papaveris*, Fabricius. This black *Aphis* curls the leaves and twists them up into crinkled masses; abundant all over Kent on mangolds, most so in Thanet.

A. lactuæ, Kaltenbach.—Wye and neighbourhood. This is a true *Aphis*, found in great abundance on sowthistles (*Sonchus arvensis* and *S. palustris*), also on garden lettuces run to seed. The pale bright green wingless females and larvæ collect in numbers on the flower stalks and fall on being shaken, especially the adult females. First noticed on June 27th and continued on through September. No winged females have been found. The shiny brown

Siphonophora sonchi (Kalt.) now and then occurs, mixed with the colonies, especially towards the end of August; also taken in July at Crundale and Herne Bay, also sent me from Haddenham, Cambs, June 27th. In the first list I recorded *Siphonophora lactucæ*, Kalt., taking Buckton's description. I have since found the true *A. lactucæ* of Kaltenbach; it is certainly a true aphid, with moderately long cornicles. *Siphonophora* (M.) *lactucæ*, described by Buckton, has longer cornicles.

A. chrysanthemi, Koch.—Wye, on chrysanthemum, September 10th, 1906; also from Great Staughton, Hunts, July 25th, 1904. Schouteden places this as a synonym of Linnæus's *A. cardui*; they appear very distinct to me.

A. atriplicis, Linnæus.—This is quite a distinct species, of a pale green colour, and must not be confused with the *A. atriplicis* of Buckton, a dark, almost black insect which I fail to separate from *A. papaveris*, Fabricius. The true (*i.e.* Linnæus's) *atriplicis* causes the leaves of various chenopodiums and also mangolds to curl upwards from the middle, forming marked boat-shaped galls. I found this insect quite common in the village of Wye, on the small creeping goosefoot (*Chenopodium polyspermum*) and on *Atriplex portulacoides*, and also producing similar deformities on mangolds and sugar beets at Wye and on the former at Herne Bay, Seasalter, and Faversham. Apterous viviparous females occurred from July 7th to September 25th, when a few nymphs were found. The insects have a mealy coat, and there are many oil globules in the galls. It often occurs alongside with *A. papaveris*, Fabricius, *A. chenopodii*, Kaltenbach, and a new species which I am describing.

A. jacobææ, Schrank. — Herne Bay, July 15th, 1911, on ragwort (*Senecio jacobææ*); winged and wingless females.

A. chærophyllii, Koch?—Wye, July 1st, 1911, on mangold leaves. A few specimens differing from other mangold aphides answered to the description of this species.

A. oxycanthæ, Koch.—On apple leaves and shoots, Wye, June 20th, 1911, and Mortimer, Berks, June 12th, 1911. This black aphid seems uncommon on apple, but appeared in numbers in the two localities mentioned this year, and caused no little harm on some Worcester pearmain at Wye. It probably comes in the genus *Myzus*.

A. chamomillæ, Koch?—On chamomile plants at Wye, June 6th, 1911. This answers generally to Koch's species, but I am not sure that it is a distinct species from *A. papaveris* until microscopic preparations have been made.

A. loti, Kaltenbach.—Wye, on *Lotus corniculatus* during May. A small black species found singly between the leaves and stems and amongst the flowers; larvæ, apterous females and one nymph. Also at Ecclesbourne Glen, May 12th, 1911.

A. avenæ, Fabricius.—On barley, Wye, June 30th, 1904, wingless females and nymphs, on oats and wheat, Wye, July 7th and September 20th, 1911, the last-named on some self-sown corn by roadside, found both on the blade and in the ears. Schouteden places the *A. fitchii*, of Sanderson, found on apples as a synonym of this species. I have so far not been able to trace the connection between these two insects, both of which occur here, and it is quite likely they are migrant forms.

A. symphyti, Schrank.—Wye, October 13th, 1911. A single apterous female on groundsel flower-head. I have been unable to find more of this very marked species.

(To be continued.)

DESCRIPTION OF OVA AND YOUNG LARVA OF *CHRYSOPHANUS AMPHIDAMAS*.

By W. G. SHELDON, F.E.S.

WHILST at Mattmar in the province of Jemtland, Sweden, I discovered on the under sides of the leaves of *Polygonum viviparum* on June 5th last several Chrysophanid ova. I did not see them actually deposited, but they were identical in every respect with ova I obtained by dissecting a female of *Chrysophanus amphidamas*, and as they differ markedly from the ova of all the other species of *Chrysophanus* occurring in Sweden, which are well known, there cannot be the slightest doubt that they are those of this species.

The description of the ova is as follows:—Horizontal diameter 20 mm.; vertical diameter 50 mm.; diameter of micropyle 15 mm.; shape spherical, somewhat flattened at the crown; colour a clear, frosted white, when looked at from above; but when viewed sideways the ovum has a beautiful opalescent sheen.

The surface is covered by a network of deeply pitted cells, rounded, but with irregular outline; six of these cells surround the micropyle.

Larva emerges by eating a large hole at the apex of the ovum, removing the micropylar area, as well as a portion of the surrounding cells.

The first larva emerged on June 23rd; the micropylar area for the two or three days previous to emergence became of a leaden tinge.

The newly emerged larva is about one millimetre in length, of a dull greenish white colour, thickly covered with long white spines; it commenced at once to feed on the under side of the leaves of *P. viviparum* alongside the midrib, forming a deep channel in which the young larva was almost hidden, and eating the lower cuticle of the leaf only.

The larvæ emerged whilst I was in Lapland, and in consequence of my being unable to keep the food-plant in water, the leaves curled up, which they have a great tendency to do, and probably crushed the larvæ; at any rate I did not see them after they were four days old.

Youlgreave, South Croydon : October 21st, 1911.

NEW GEOMETRIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Spilopera rubridisca, sp. n.

♀. Pale ochreous brown, sparingly dusted with fuscous. Fore wings suffused with reddish on central area; a white centred purplish spot at end of cell; antemedial line dusky, angled below costa, where it is dotted with black; postmedial line purplish brown, oblique from apex to dorsum; some purplish marks below apex; subterminal line, indicated by purplish dots, starts from costa before apex, curves under oblique line, thence almost parallel with it to dorsum. Hind wings have a purplish spot at end of cell—this is centred with white on the left wing, but not on the right wing; postmedial line purplish brown, appearing to be a continuation of the line on fore wings; traces of a dusky subterminal line. Under side similar to above, but the postmedial lines are indistinct, and the subterminal lines are indicated by black dots.

Expanse, 36 millim.

Collection number, 1606.

A female specimen, minus fringes, from Kanshirei (1000 ft.), May 2nd, 1908.

Craspedia indigenata, sp. n.

♂. Whitish brown, irrorated with darker brown, especially on the outer area of all the wings. Fore wings: antemedial line brown, slender, dotted with black on each nervure; medial line brown, very faint, undulate; postmedial line brown, slender, double, sinuous, dotted with black below costa, marked with black about middle and at dorsum. Hind wings agree in colour with the fore wings; discal dot black; antemedial and postmedial lines brown, the former very indistinct, the latter dotted with black. Fringes paler, preceded by an interrupted black line. Under side rather paler than above, lines more distinct.

Expanse, 26 millim.

Collection number, 886.

One specimen from Punkio (4000 ft.), August 4th, 1908.

Near *C. ligataria*, Walk.

Acidalia arizana, sp. n.

♂. Pale brown, the area within the medial line of fore wings and the antemedial line of hind wings suffused with fuscous. Antemedial line of fore wings hardly darker than the area it crosses, angled below costa; postmedial line brownish, nearly parallel with termen; veins beyond the postmedial line whitish, dotted with black; terminal series of black marks between the veins; a black dot at end of cell. Hind wings have the termen slightly angled at vein five; faint black dot at end of cell; antemedial line brown, rather broad; postmedial line brownish dotted with darker; veins beyond postmedial line whitish dotted with black; terminal dots as on fore wings.

Under side whitish, markings similar to those of upper side, but the dots on terminal area less distinct.

Expanse, 28 millim.

Collection number, 883.

A male specimen from Arizan (7300 ft.), September 12th, 1906.

Chrysocraspeda duplicilinea, sp. n.

♂. Fore wings pale yellow, costa reddish towards the base; antemedial line red; postmedial line red, double, outwardly angled below middle; subterminal line red, double, interrupted, marked with purplish towards tornus; a reddish dot at end of cell. Hind wings pale yellow; red lines as on fore wings, but brighter and more distinct; the subterminal line single, followed by a red band on termen. Under side whitish, markings of upper side faintly indicated.

Expanse, 23 millim.

Collection number, 91.

A male specimen from Takow (on the plains), September 2nd, 1904.

Seems to be allied to *C. marginata*, Swinhoe, from Burma.

Anisodes lentiginosaria, sp. n.

♂. Fore wings yellow, freckled with reddish orange; antemedial line dusky, indistinct except towards the costa; spot at end of cell black, enclosing a white speck; a dusky shade-like band just beyond discoidal spot; postmedial line black, undulated, preceded by black dots on veins three, four, and six; area beyond postmedial clouded with purplish and blackish, chiefly towards dorsum; fringes yellow. Hind wings yellow, freckled with orange; antemedial band purplish mixed with black, enclosing a black-ringed white spot; postmedial line purplish mixed with black, preceded by black specks set in reddish orange dots; area beyond postmedial purplish, traversed by an interrupted line of the ground colour. Under side paler, markings fainter.

♀. Similar to the male, but less freckled; the medial line of fore wings and the antemedial line of hind wings are reddish.

Expanse, ♂ 38 millim., ♀ 32 millim.

Collection number, 861.

One example of each sex from Arizan (7300 ft.), August, 1908. I have also a male specimen from Tozan (8500 ft.), September, 1906 (No. 1600 F).

Hydrelia rubrivena, sp. n.

♂. Fore wings brown, tinged with reddish; subbasal line blackish; antemedial line blackish, indistinct, preceded by a still less distinct line; postmedial line black, wavy, indistinct towards dorsum, outwardly edged with red, which colour is extended along the veins; traces of a blackish subterminal line, chiefly towards the costa. Hind wings brown; three dusky, curved, and interrupted lines, all

indistinct. Fringes pale brown, preceded by black dots at ends of the veins. Under side whitish; fore wings from base to postmedial line dusky; hind wings with blackish dot at end of cell, and a blackish postmedial line; the latter is slightly serrated and indented opposite cell.

Expanse, 26 millim.

Collection number, 882.

A specimen from Arizan (7300 ft.), September 14th, 1906.

ab. *obscura*, nov.

♂. General colour as in *rubrivena*, but all markings are much obscured and difficult to trace; similar to the type on the under side.

Collection number, 882A.

One male specimen from Arizan, September 27th, 1906.

THE MACRO-LEPIDOPTERA OF THE WORLD.*

THE plan of this great work, which is appearing both in German and in English, is as follows. There are to be four principal parts or sections, dealing respectively with the fauna of the Palæarctic, Indo-Australian, Æthiopian, and American regions, and each part, again, will comprise four volumes, the first, third, and fourth of each series covering the Rhopalocera, Noctuidæ, and Geometridæ, the second the much more heterogeneous residue—most of which have figured as “Bombyces” in the older entomological literature. Thus Dr. Seitz hopes, in sixteen volumes (some of which we fear may prove rather unmanageably bulky), to provide a complete account of the known Macro-Lepidoptera, with figures of nearly all the principal forms.

Numerous of the volumes are in progress, several (especially on the Butterflies) well advanced; while we have before us the completed first volume, the Palæarctic Rhopalocera, bound in two parts, the letterpress and the plates separately, and thus of a convenient size for handling. The only main group on which nothing has yet appeared is the Geometridæ, and we learn that vol. iv. (Palæarctic Geometræ) is now in preparation, will commence to appear at the beginning of 1912, and will be published rapidly.

Any who look for a complete biological or morphological work will, of course, not find it here. Even if the time is ripe for such, it is difficult to conceive of any at present workable plan whereby it could be carried out. At the same time, it is only justice to Dr. Seitz and his numerous collaborators to emphasize the fact that they are providing much more than the

* Edited by Dr. A. Seitz. Stuttgart: Alfred Kern, Verlag, Poststrasse 7.

“illustrated catalogue,” which was somewhat slightly spoken of when the work was first announced a few years ago. Brief descriptions of the earlier stages are included wherever these are known, and the dry descriptive matter is often enlivened by notes on the habits of the imago. Scientifically, too, the names of such contributors as Jordan, Aurivillius, and others are guarantee that we have work of real classificatory value, and their synopses and differentiations should be a real help to advanced students.

The completed volume (vol. i.) will appear to many to be less important than most of those which follow, as we have already so many good text-books and iconographies of the Palearctic Rhopalocera. On the other hand, the large number of the students of the group justifies an extensive literature, and the present volume by no means duplicates its predecessors, but gives a wider view of the Palearctic area and much new or newly collected information.

The illustrations are for the most part good, and of practical use for the determination of species. We wish the enterprise continued success.

NOTES AND OBSERVATIONS.

SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY.—The Second International Congress of Entomology will be held at Oxford from August 5th to 10th, 1912. Further particulars will be announced shortly.

The President of the Congress is Professor E. B. Poulton, D.Sc., F.R.S.

The Executive Committee proposes to find for Members of the Congress lodgings in the town, or rooms in one or more of the Colleges, at a moderate charge; rooms in the College will be available only for men. The Executive Committee invites an early provisional notice of intention to join the Congress, in order to be able to make the arrangements for the necessary accommodation. The proceedings of the First Congress are in the press and will be published shortly. All communications and enquiries should be addressed to the General Secretary of the Executive Committee, Dr. MALCOLM BURR, c/o the Entomological Society of London, 11, Chandos Street, Cavendish Square, London, W.

ABNORMAL UNION OF BUTTERFLIES.—While collecting in Pusztá Peszer on June 12th this year, I captured a specimen of *Argynnis daphne* in copula with a *Melitæa athalia*. The two specimens were transferred from the net into a pill-box and remained united for some considerable time. On examination after they came apart both specimens proved to be males.—N. CHARLES ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

NOTE ON THE ROOSTING HABITS OF *HELICONIUS CHARITONIA*.—My attention was first drawn to observe the manner of clustering together in groups of this species when asleep, by Bersa, who told me

that he noticed a dozen or so every morning at about six a.m., congregated always on the same twig of the same plant (*Phenax hirtus*, "a member of the nettle family"), growing deep down in a gorge, and overhanging the rocky bed of the stream—all apparently, at that early hour, sound asleep. I therefore visited the same spot one evening, between five and six p.m., and found as we had expected, that they had now begun to assemble for the night. I counted eight specimens, clustered closely together on one small twig, all with their long, closed wings hanging downwards—a withered twig it was, covered with brown, prickly seeds, possessed of unusually adhesive tendencies, and it struck me that this was probably the main cause for this twig, and others always more or less dried up, being especially favoured; though of course it also admits of protective suggestions. Bersa said he had always found them in the morning on these very same twigs. When disturbed they flopped sleepily about in the immediate neighbourhood, but soon tried to resettle, invariably rejecting all the green leaves, and returning ultimately to the dried-up dead twigs by preference, most of them selecting the same one as before. —MARGARET E. FOUNTAINE, F.E.S.; Bath, Jamaica, October 7th, 1911.

STRIDULATION IN THE PUPA OF AN ICHNEUMONID.—During the month of June last I noticed that several of the Tortrix larvæ that I beat from oak carried a small external parasitic larva firmly attached to the second and third segments. Some of these parasitised caterpillars I kept in chip boxes, and in the course of a few days the parasitic larvæ, which were then of a pale green colour, and nearly as large as their hosts had been when first attached, had completed their growth and spun thin transparent, papyraceous, white cocoons, with a medial band of a thicker texture. In a state of nature these cocoons are formed within the rolled leaf which has previously been inhabited by the host, and a curious thing about them is that if wetted they turn to a deep brown in colour. As soon as the larvæ had changed to pupæ, I was much surprised to find that they made a very noticeable sound by wriggling in their cocoons. The noise appeared to be produced by the abdomen, and, in the case of the female, the ovipositor, which was curled over the back in the usual way, being scraped against the cocoon, and was distinctly audible at a distance of several yards, so much so that a maid, whose duty it was to clean the room in which these pupæ were kept in a drawer, was much alarmed and distressed, thinking she had heard a "ticking spider" (the local name for the death-watch beetle). The imagines emerged in July, and I at first took them to be the Lissonotid *Phytodictus*, but on submitting a specimen to Mr. Claude Morley, he very kindly pointed out that they were *Phytodictus polyzonias*, Forst. — G. T. LYLE; Brockenhurst.

LEPIDOPTERA OF TORQUAY.—In a list of the moths and butterflies occurring in the Torquay district (Journal of Torquay Nat. Hist. Soc.), Mr. H. Lipton enumerates upwards of five hundred and twenty species and varieties.

RHOPALOCERA OF CYPRUS.—Mr. John A. S. Bucknill, in a Supplement to 'English School Magazine,' Easter, 1911, gives a "List of

the Butterflies of Cyprus." Sixty-three species are mentioned, and of these about twenty are noted as occurring also in Britain.

THE LEPIDOPTERA OF LINCOLNSHIRE.—Mr. G. W. Mason, of Barton-on-Humber, has published the fourth part of his 'Annotated List of Lepidoptera of Lincolnshire.' This treats of the "Micros," of which about four hundred and eighty-five species are known to occur in the county. The List of Butterflies was published in the 'Lincolnshire Naturalists' Union Transactions' for 1906. Heterocera, Parts i.-iii., appeared in the Transactions for 1907, 1908, and 1909 respectively. Part iv. was published in 1910.

UNUSUAL DATES OF OCCURRENCE AND EMERGENCE OF LEPIDOPTERA IN 1911.—The following records in this connection may be of interest. *Argynnis euphrosyne*, August 17th; *Porthesia similis*, September 20th, two males at light; *Leucania pallens*, September 23rd, in good condition, at sugar. *Dioryctria splendidella*, first appeared June 4th; *Dasycampa rubiginea*, bred from ova on August 20th (of course without artificial heat). Besides these, I may mention the occurrence of a third brood of *Trichoptilus paludum*. This species was on the wing in fresh condition during the second week of June, the first and second weeks of August, and again in the second week of September. Specimens of the first and second broods were bred from larvæ found full-grown on May 21st and July 12th respectively; the second brood was by far the most numerous, and the third was by no means rare. *Nemoria viridata* also had a partial third brood. Several imagines were taken on May 27th, and ova obtained from a female captured then gave us larvæ which pupated about July 16th; five pupæ were obtained, from two of which imagines emerged on August 9th and September 7th, respectively, the other three remaining over the winter. Most of these observations are due to my brother, R. J. Champion; they all refer to localities in the south-east of England, chiefly in Surrey.—H. G. CHAMPION; New College, Oxford, October 29th, 1911.

ACHERONTIA ATROPOS IN CORNWALL.—On September 19th a very fine specimen of the above was taken by Mrs. Luke, of Mount Pleasant, Camborne, settled upon her lawn. She very kindly forwarded the insect as an acceptable present to me.—A. J. SPILLER; Godolphin Cross, Helston.

On September 24th two specimens of *A. atropos* came to light in the Lizard district.—B. HAROLD SMITH.

ACHERONTIA ATROPOS IN NORFOLK.—On August 4th I received a full-fed larva of *A. atropos* from Bladeney, Norfolk.—H. M. EDELSTEN; The Elms, Forty Hill, Enfield.

ACHERONTIA ATROPOS IN BERKSHIRE.—I should like to record the capture of *A. atropos* at Wargrave, Berks, by my sister, Miss A. Dolton. It flew to the light in the kitchen, about 7 p.m., on October 6th, and was eventually secured in a cake tin. It is a fine specimen and in very good condition.—H. L. DOLTON; 27, Brunswick Street, Reading, October 12th, 1911.

SPHINX CONVULVULI IN SURREY.—A specimen in fair condition was brought to me by Eric Mackney, the moth having been taken in a shop in Kingston-on-Thames on October 11th last.—W. J. LUCAS ; Kingston-on-Thames.

SPHINX CONVULVULI IN WORCESTERSHIRE.—A specimen of *S. convolvuli* was brought me alive and in fairly good condition on September 22nd. The species has been taken here before, but not often. We are far inland, quite the middle of England.—(Rev.) A. DAY ; The Vicarage, Malvern Link.

SPHINX CONVULVULI IN BEDFORDSHIRE.—It may be of interest to note that I had a fine female *S. convolvuli* brought to me on September 19th last. The specimen was quite stiff, and had apparently been dead about a fortnight. It was discovered on a book in an office in Luton, Beds.—L. G. HIGGINS ; Furzedown, Harpenden, Herts.

SPHINX CONVULVULI IN THE ISLE OF MAN.—I have just received a specimen of *S. convolvuli* taken alive this September by a friend on the sea coast near Port Erin, Isle of Man. This locality is interesting to record in connection with those mentioned in the 'Entomologist' for August.—E. O. CROFT, M.D., F.E.S. ; 28, Clarendon Road, Leeds, October 5th, 1911.

SPHINX CONVULVULI IN HANTS.—Mr. Cecil Haig has asked me to record the capture of eight specimens of *S. convolvuli*, four males and four females, from August 21st to September 11th, at Exbury, Hants. They were brought to him by a friend who took the moths, which had flown into his house. Other specimens were seen in the garden, but were not taken.—E. S. A. BAYNES ; 120, Warwick Street, S.W.

SPHINX CONVULVULI IN ISLE OF WIGHT.—During the last week in August and the first week of September numbers of *S. convolvuli* were seen hovering around the tobacco plants in our garden at Ryde. They were exceedingly difficult to catch, and I only managed to capture two specimens, one of which came to light in a room.—A. C. MORRIS ; Gibson's Hill, Upper Norwood.

SPHINX CONVULVULI AT MANCHESTER.—On September 5th an example of *S. convolvuli* was captured in a narrow street in Ancoats, Manchester, by one of the juvenile members of the Heyrod Street Lads' Club. This unusual visitor to Ancoats is now preserved in the Club "Museum."—T. A. COWARD ; Bowdon, Cheshire.

SPHINX CONVULVULI IN NORTH DEVON.—Mr. K. Rhodes, of Bowdon, has shown me a specimen of *S. convolvuli*, captured at Woolacombe Bay, North Devon, on August 24th.—A. W. BOYD ; The Alton, Altrincham, Cheshire, October 19th, 1911.

SPHINX CONVULVULI IN SURREY.—Two female specimens of *S. convolvuli* were captured at light on August 25th. A clump of *Nicotiana affinis* was growing in the border just below the window, and a male was taken at the flowers on September 1st ; other specimens were also noticed at the flowers during the early part of the month.—B. HAROLD SMITH ; Edgehill, Warlingham, Surrey.

SPHINX CONVULVULI REARED FROM OVA TO PUPÆ.—It may be of interest to record the rearing of *S. convolvuli* larvæ, from ova deposited by a female captured on September 7th; several ova were obtained and the larvæ hatched out on the 15th and 16th. *Convolvulus sepium* was given as food. After each moult, which was of short duration, they fed at an enormous rate, and duly pupated on October 9th, 10th, and 11th.—G. NOBBS; North Lodge, East Cowes, Isle of Wight, October 24th, 1911.

SPHINX CONVULVULI IN KENT.—We wish to record the capture of two specimens of *S. convolvuli* this year. The first of these was netted at about 9 p.m. on September 13th at a bed of petunias, having seen it on some verbenas a quarter of an hour previously. Another was seen on the same petunias the next evening at dusk, and on September 16th we captured one on white *nicotiana* (tobacco plant) at 7.20; we had been watching it for some time in the twilight, hearing the hum of its wings most distinctly as it flew from flower to flower. Both specimens captured are males. We saw a third specimen about a week later, but failed to catch it. A noticeable point was that they entirely disregarded the dark red *nicotiana* blossoms, though they were more plentiful in the garden than the white; this must be either owing to the fact that they are less visible in the darkness, or that, being more highly cultivated than the white, they have less scent or honey, just as the most highly cultivated mignonette has no scent at all.—P. A. and D. A. J. BUXTON; Fairhill, Tonbridge.

SPHINX CONVULVULI AND ACHERONTIA ATROPOS IN HAMPSHIRE.—This is evidently a great year for the larger hawk moths. I have had four specimens of *S. convolvuli* brought me this month, and have seen another flying round one of the electric lamps in the town, while news of a good many more having been taken in the neighbourhood has reached me. A week ago a fresh specimen of *A. atropos* was brought me.—(Rev.) J. E. TARBAT; Farnham, September 27th, 1911.

SPHINX CONVULVULI AT DOVERCOURT.—This species appears to have been rather common in this neighbourhood this autumn, for I have had five brought to me. The first on August 23rd; one on September 7th; one on September 8th; one on 12th, and the last on September 13th. Two of these were very large and fine, and quite uninjured, but the other three had been so roughly handled that they were unfit for the cabinet.—GERVASE F. MATHEW; Dovercourt, November 20th, 1911.

AGROTIS EXCLAMATIONIS, &c., IN SEPTEMBER.—In view of the recent record of a second generation of *A. exclamationis* in the 'Entomologist' for October, you may be interested to hear that we took this species at sugar here several times. August 30th (three females, fresh), September 1st (one male), September 6th (one) and September 21st. I also hear of the capture of two specimens in late August near Norwich. *A. segetum* was found in fresh condition at sugar on September 1st and 8th. *Barathra* (*Mamestra*) *brassicæ* occurred quite fresh on August 30th (one), September 1st (two), Sep-

tember 4th and 8th (two). All the above must surely be examples of a second brood emerging in this unusually favourable summer. *Noctua xanthographa* continued in fresh condition till September 4th. It seems probable that some of these specimens belonged to a second brood. Even in a normal year fresh specimens would be over long before the end of August. Unfortunately we were not at home in July, and so cannot say when the species came out first. *Hadena protea* was very abundant at sugar in early September, and a few specimens came to light. We never saw one in 1910.—P. A. and D. A. J. BUXTON; Fairhill, Tonbridge.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—This species is not unknown here in the month of September. I find I have the following records:—September 9th and 26th, 1893, at sugar; September 4th, 1900, at sugar; September 10th, 1906, at sugar.—F. C. WHITTLE; 7, Marine Avenue, Southend.

AGROTIS EXCLAMATIONIS, &c., IN AUGUST.—*A. exclamations* occurred in the garden here between August 22nd and 31st this year. I also noted *Hadena oleracea* on August 27th; *Plusia moneta* and *P. chrysitis* on August 19th and 20th respectively. *Hepialus lupulinus* was seen on August 19th.—F. W. J. JACKSON; Woodcote End House, Epsom.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—In the 'Entomologist' for October, 1911, I noticed an Editorial note to the effect that *Agrotis exclamations* was not usually taken in September. Whether this species always occurs in that month in this particular locality, sheltered as it is to the north by Portsdown Hill, I do not know, as I have no previous experience to judge from, but this season at any rate the second brood was to be taken freely at sugar from the middle of August up to September 10th in perfect condition, the specimens being rather more finely marked and of a more distinct clarety shade on the fore wings than in the first brood. I sugared in my small garden here regularly from August 10th up to the end of September, and the extraordinary abundance of the second brood of many of our common species was most noticeable, especially as I had only been able to take one or two of the earlier brood in June, and in some cases had not noticed the presence of the species at all. The more conspicuous and abundant were, in addition to the above—*Acronycta psi*, one only on August 31st; *Mamestra brassicae* up to October 10th; *Triphaena pronuba* to October 11th; *Caradrina cubicularis*, *Agrotis puta* and *Agrotis segetum* to the present date; *Hadena suasa* to August 25th; *H. chenopodii* and *H. oleracea* exceedingly abundant to the end of September; *Acidalia imitaria* to September 3rd; *Timandra amataria* to September 6th, and *Eupithecia centaureata* to September 30th; perfect specimens of each were obtained on the dates mentioned, whilst those that extended into the present month have been in great numbers on the ivy, the same remark applying to *Triphaena comes* which has been noticed every month from June onward. A larva of *Agrotis exclamations* taken on August 9th pupated the next day, the imago emerging on August 19th, thus showing the extraordinarily short duration of the pupal stage in this unusually hot summer. In this connection, however, perhaps the most ex-

traordinary capture was that of *Uropteryx sambucaria* at light on October 13th, in view of the fact that this species passes the winter in the larval stage.—LESLIE H. MOSSE-ROBINSON; Margaret Villa, Porchester, Hants, October 22nd, 1911.

AGROTIS EXCLAMATIONIS IN SEPTEMBER.—Referring to Mr. J. S. Carter's record of the capture of three specimens of *A. exclamationis* in September and the Editorial note on the same, in the 'Entomologist' for October, perhaps it is worth mention that I found this species common at sugar on the Devonshire coast in September. Furthermore, I took a long series at sugar a few years ago at Shanklin, Isle of Wight, during the month of September, under the impression that the species was *A. corticea*. I still have this series in my cabinet. They are smaller, somewhat paler, and more distinctly marked than the first brood. It seems probable that the species is normally double-brooded, at any rate on the South Coast. I cannot recall the capture of the species in the Midlands during September or October.—(Dr.) BECKWITH WHITEHOUSE; 52, Newhall Street, Birmingham.

AGROTIS EXCLAMATIONIS AND MAMESTRA BRASSICÆ IN SEPTEMBER.—With reference to Mr. Carter's note in the October number of the 'Entomologist,' it may be of interest to mention that fresh specimens of *Agrotis exclamationis* came to sugar in my garden here on September 7th and 8th. Throughout September *Mamestra brassicæ* appeared at sugar in some numbers, and one was seen at ivy-bloom on October 16th.—A. R. KIDNER; Swinney Garth, Hatherley Crescent, Sidcup, Kent.

MAMESTRA TRIFOLII: THIRD GENERATION.—*M. trifolii* has been very abundant here this season. A female taken early in August laid a batch of ova. The larvæ fed up rapidly and the moths are now emerging—a third generation.—H. M. EDELSTEN; Forty Hill, Enfield, October 3rd, 1911.

LAPHYGMA EXIGUA IN CORNWALL.—On September 20th last a specimen of *L. exigua* came to light in the Lizard district.—B. HAROLD SMITH.

EPHYRA PENDULARIA var. SUBROSEATA, Woodforde, in LINCOLNSHIRE.—I have bred a number of this variety from ova laid by a typical female taken in a wood near Lincoln in June, 1910. The majority of those which emerged were this form.—G. W. MASON; Barton-on-Humber.

COLIAS EDUSA IN WEST CORNWALL.—In October I saw a male *Colias edusa* in the grounds of Penrose (near Porthleven); another was seen on the way to Penrose by the cliffs from Porthleven, and another (a few days earlier) on the towans near Hayle. I had been staying in West Cornwall from September 1st but had seen no *C. edusa* until the first week in October. It was just the same, I remember, when I was staying in the same district a few years ago; but then in the first ten days of October I saw quite a considerable number of *C. edusa*.—HAROLD HODGE; 9, Highbury Place, London, N.

COLIAS EDUSA IN CHESHIRE.—On September 24th I took a specimen of *Colias edusa* at Parkgate in the Wirral peninsula of Cheshire.—A. W. BOYD; The Alton, Altrincham, Cheshire, October 19th, 1911.

COLIAS EDUSA IN CORNWALL.—A few specimens were seen in the Lizard district during September, but they only appeared one at a time.—B. HAROLD SMITH; Warlingham, Surrey.

COLIAS HYALE AT DARTFORD.—I captured five male specimens on September 2nd. No example of the female was seen.—A. J. EXETER; Southern Hospital, Dartford.

COLIAS EDUSA AND COLIAS HYALE AT COLCHESTER.—On September 25th I captured a fine, quite fresh, male specimen of *C. edusa* in a lucerne field here; the following day, while my son was intent on collecting larvæ of *Cryptoblabtes bistrigella*, a male *C. hyale* flew past him.—W. H. HARWOOD; Colchester.

COLIAS HYALE IN ESSEX.—I took a specimen of *C. hyale* at Dunmow, on October 2nd, flying over some lucerne.—H. M. EDELSTEN; Forty Hill, Enfield.

COLIAS HYALE IN ESSEX.—The only *Colias* I have seen here this year is one male of *C. hyale* which my son caught with his straw hat on August 30th.—EDWARD A. FITCH; Maldon.

MACROGLOSSA STELLATARUM AND POLIA XANTHOMISTA, &c., IN CORNWALL.—This species abounded in the Lizard district, in September. I was much interested in watching one hawking up and down the lee side of some tamarisk bushes at 6.30 p.m. in a strong south-west gale, with rain and sea fog. At sugar, *P. xanthomista* and *P. flavicincta*, *E. nigra* and *A. australis*. Some nice black varieties of the latter turned up in fair abundance, also several examples of second broods of *A. exclamationis*.—B. HAROLD SMITH; Warlingham, Surrey, October 10th, 1911.

MACROGLOSSA STELLATARUM IN WEST CORNWALL.—This moth was very common about Hayle in September and in the earlier days of October this year. There were other twos and threes together in the conservatory in the house where I was staying. One was found in a bedroom as though it was going to hibernate.—HAROLD HODGE.

STERRHA SACRARIA IN CORNWALL.—On September 8th a female *S. sacraria* was captured flying over rough grass, but though kept for eggs refused to lay. Careful searching did not produce any more, though a friend took a male in the same place a night or two before.—B. HAROLD SMITH.

HELIOTHIS ARMIGERA IN THE ISLE OF WIGHT.—When sugaring with the Rev. J. E. Tarbat at Freshwater, on September 11th, we took a fine *H. armigera*.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

PERIZOMA (EMMELESIA) TENIATA IN NORTH DEVON.—A stay at Lynton, North Devon, during the first fortnight in July, disappointing from an entomological point of view, was redeemed by the capture of about thirty specimens of *P. teniata*. They were taken just above Watersmeet, and I have since seen that the locality is given in Mr.

R. South's 'Moths of the British Isles.' It is satisfactory to find that the insect survives in this its most southern locality. The unworkable nature of the ground gives hope that it will continue to do so. The specimens are of the pale form, with a moderately dark band.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

TIME OF APPEARANCE OF *STILBIA ANOMALA*.—Most authorities give August and September for *S. anomala*, others early in August or even the end of July. Here we take the insect in great profusion by searching the grasses on the edge of a common, flanked by a ditch and hedge surrounding a pinewood. None are taken more than a few yards from this hedge. In normal years not a specimen is to be had before the first week in September, and then only the males, the females following about a week later. In this year, when all species were early, the following dates may be of interest:—August 15th, males just beginning to emerge; August 23rd, males in profusion, only one female taken; August 30th, males comparatively scarce, females in almost equal numbers, but evidently out a day or two. The moths soon get damaged, and it is easy to detect a freshly emerged specimen. The larvæ are found in great numbers on the same spot in the early spring.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

XANTHIA OCELLARIS NEAR DOWNHAM MARKET.—On September 6th last I had the good fortune to take a male specimen of *X. ocellaris* a few miles from here.—ROBT. S. SMITH, Jun.; The Laurels, Downham Market.

CHÆROCAMPA (*EUMORPHA*) *ELPENOR* IN NOVEMBER.—On November 7th my brother sent me a specimen of *C. elpenor* which had been captured in a shop. This seems to be an unusually late date.—ROBT. S. SMITH, Jun.

SPILOSOMA LUBRICIPEDA AND *PORTHESIA SIMILIS* IN SEPTEMBER.—On September 26th I took a male specimen of *S. lubricipeda* and two males of *P. similis* off lamps.—DOUGLAS H. BUTLER; Hayling House, Reading.

ARCTIA CAIA IN OCTOBER.—A male specimen of *A. caia* was brought to me on October 8th last. The moth had only just emerged from the pupa; in fact, it completed the drying of its wings after I received it.—A. J. EXETER; Southern Hospital, Dartford, Kent.

PHRYXUS LIVORNICA IN CORNWALL.—Two specimens of *P. livornica* came to light on September 10th.—B. HAROLD SMITH; Warlingham, Surrey.

PHRYXUS LIVORNICA IN EAST DEVON.—A splendid example of *P. livornica* was brought me early in September, captured in a friend's greenhouse. It was in perfect order, save for a rub on the thorax, due to the small box in which it was packed, and had evidently only just emerged.—(Rev.) JOHN W. METCALFE; Ottery St. Mary.

PLUSIA NI IN CORNWALL.—On September 11th, when staying in the Lizard district, a specimen of *P. ni* was captured at flowers of Virginia stock.—B. HAROLD SMITH; Warlingham, Surrey.

PYRAMEIS ATALANTA, ab.—Referring to Mr. A. W. Lynn's note in 'Entomologist' for November, asking for previous records of the above ab., I beg to state that I have a similar one in my collection, captured in Guildford, Surrey, and exhibited at the South London Natural History Society (see 'Entomologist,' vol. xxxix. p. 111).—W. E. BUTLER; Hayling House, Reading.

SECOND BROOD OF BOARMIA REPANDATA.—Larvæ from the usual summer brood of *B. repandata* fed up and pupated, and produced perfect insects during September and October. One of the moths, a male, is a black specimen. All were strongly and beautifully marked, and some were intermediate between strongly marked and black—the black showing on the basal half of the wings. The parents of the first brood were reared from Delamere Forest larvæ, and I have caterpillars now from eggs laid by females of the second brood of moths.—J. THOMPSON; 20, South View, Chester.

CATOCALA NUPTA, ab.—At the end of August last a specimen of *C. nupta*, in which the usual reddish colour of the hind wings was replaced by dusky brown, came to light.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

CHRYSOPHANUS PHLEAS, ab.—*C. phleas* was in great numbers near the Lizard, Cornwall, last September. I took one female which had the right fore wing mainly white instead of the usual copper colour.—B. HAROLD SMITH.

DRAGONFLIES BRED IN 1911.—I have bred this year *Æschna grandis*, *Æ. cyanea*, *Ischnura elegans*, *Agrion puella*, *Erythromma najas*, *Pyrrhosoma nymphula*. I did not find it a good season for nymphs; a week-end at Wicken Fen at Whitsuntide produced but a few; it was of course rather late for them. *Brachytron pratense* was flying in fair numbers.—HAROLD HODGE.

NOTES ON DURHAM LEPIDOPTERA.—*Eupithecia innotata*. I obtained a few larvæ last year in Durham from scabious and rose, that I took to be *E. fraxinata*. However, when the insects emerged this year they proved to be *E. innotata*. My friend, Mr. Johnson, of Gateshead, deserves the credit for detecting these larvæ on scabious, for he took a fair number in 1909 from which no moths were reared the following year. These food-plants seem unusual, but the larvæ from ova laid by bred females fed readily on a potted plant of *Artemisia absinthium* I had ready for them. The females pair readily enough, but they have a decided objection to depositing their ova. I secured about two dozen and have nine pupæ. A point worthy of note is that the insect is double-brooded in captivity, although perhaps the present season has not been suitable for giving one a general rule. I was unable to go for wild larvæ this year.—*Oporabia autumnata*. I have discovered this species in tolerable abundance in a mixed birch and alder wood at Birtley, North Durham. The forms were quite typical.—*O. filigrammaria*. This too occurs not uncommonly at Birtley. One locality is on heather, but what it feeds on at the other, unless it is elder or hawthorn, is a mystery to me.—*O. christyi*. One female on a telegraph pole at Birtley.—*Hydriomene ruberata*.—Very common indeed at Birtley. Nearly all are of the red form, but the type occurs

and so does a uniformly black aberration with markings practically obscured. This form is hereby named *aterrima*.—*H. impluviata*. Nearly all the specimens are black (ab. et var. *nigerrima*, mihi), although those occurring in one swamp have a pale spot on the dorsum where the central fascia normally ends (ab. *unipunctata*).—*Selenia tetralunaria*. I beat a single larva from birch which yielded a male of this species; this provides the first Durham record.—*Vanessa io*. I caught one in August on a tansy head. This is the first taken in Durham for many years.—J. HARRISON; 181, Abingdon Road, Middlesborough.

ENTOMOLOGICAL CLUB.—A meeting was held at the Savage Club, Adelphi Terrace, W.C., on Nov. 16th, 1911, Mr. H. Rowland-Brown in the chair. Other members present were Mr. R. Adkin and Mr. Horace St. John Donisthorpe; Honorary Members: Mr. A. H. Jones and Mr. A. Sich. Mr. Adkin proposed that Mr. Sich, an Honorary Member, be elected a Member of the Club; this was seconded by Mr. Rowland-Brown. Ballot to be taken at next meeting. On the proposition of Mr. Donisthorpe, seconded by Mr. Adkin, Dr. Malcolm Burr was nominated an Honorary Member of the Club. This being the first meeting of the Club since the death of Mr. G. H. Verrall, the Chairman, referring to the great loss the Club has sustained, testified to the many excellent qualities of the late member. It was largely due to Mr. Verrall's exertions that the Club was revived at a time when dissolution seemed inevitable. The other Members present—Mr. Adkin and Mr. Donisthorpe; also Dr. Dixey and Mr. Sich—offered tributes to the memory of one who had taken such deep interest in the welfare of the Club, and was largely instrumental in establishing it in the secure position it holds in this the eighty-fifth year of its existence.—RICHARD SOUTH, *Hon. Sec.*

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 4th, 1911.*—The Rev. F. D. Morice, President, in the chair.—Mr. C. B. Williams, of 20, Slatey Road, Birkenhead, was elected a Fellow of the Society.—The President proposed a vote of condolence with the relatives of the late Mr. Verrall, which was seconded by Professor Poulton.—A vote of condolence with the relatives of the late Mr. Albert Harrison was proposed by the Rev. G. Wheeler, and seconded by Mr. W. J. Kaye; and a similar vote in the case of Dr. Scudder was proposed by Mr. Champion, and seconded by Professor Poulton.—Mr. Donisthorpe exhibited specimens (males and workers) of *Formica pratensis*, De G. (*congerens*, Nyl.), taken at Rannoch in June; also workers of *F. sanguinea* captured in the same region, a new locality for it; and females and workers of a new race of *Formica rufa*, also from Rannoch.—Mr. Bethune-Baker, a specimen of *Melanargia galatea* var. *lugens*, taken at Digne in July last. It is an entirely dark brown (almost black) form, with no white markings, though the ordinary markings are just traceable in a slightly lighter shade. Commander Walker observed that a similar example had also been taken in

England.—Mr. Norman H. Joy, a remarkable specimen of *Oxytelus* taken at Tresco, Scilly Isles, April, 1908. In many respects it is quite intermediate in character between *O. sculptus* and *O. laqueatus*, Marsh. It is probably a species new to science, but may possibly be a hybrid of these two species. He also showed *Liodes stenocoryphe*, Joy, male, taken by Mr. W. E. Sharp, at Forres, in 1910, as well as its near allies for comparison, viz. *L. picea*, Ill., taken by Mr. Tomlin and Mr. Joy at Dalwhinnie, Inverness-shire, in September, when the larva was also found feeding on a small underground fungus; *L. dubia*, King, and its various varieties, and *L. algerica*, Rye, almost certainly only another variety of this species.—Mr. W. C. Crawley, a mixed colony of *Lasius umbratus* and *L. niger*. This colony consists of a female *L. umbratus*, which was accepted in 1908 by a queenless colony of *L. niger*. During 1909 and 1910 only *niger* workers came to maturity in the nest; those, therefore, that hatched in 1910 must have been from parthenogenetic eggs laid by the *niger* workers. Over a dozen of these latter were dissected, and found to contain no *receptaculum seminis*.—Mr. Donisthorpe commented on the interest of Mr. Crawley's experience, remarking that while it had formerly been supposed that parthenogenetically laid ova produced only males, Mr. Crawley had shown, and proved by dissection, that workers were capable of parthenogenetically producing workers. The President observed that parthenogenesis was not unusual in sawflies, and mentioned that in *Cræsus varus*, which had been founded on a male specimen, the original specimen was the only male known. Dr. M. Burr remarked that the common "stick insect" is largely parthenogenetic, and has been bred parthenogenetically for more than twelve consecutive generations.—Mr. E. A. Cockayne exhibited a melanic specimen of *Lithosia deplana*, male, taken in Surrey last July.—Mr. J. Platt Barrett, some species of Sicilian butterflies taken this year, in contrast with corresponding British species, viz. *Euchloë cardamines* and *E. damone*, *Gonepteryx rhamni*, and *G. cleopatra*, *Hipparchia semele*, and var. *algerica*. Small southern forms were also exhibited of *E. cardamines* and *Leptosia sinapis*.—Dr. Chapman, living larvæ of *Albulina pheretes*, and a living imago of *Latiorina orbitulus*; and observed that his former suggestion that *A. pheretes* had probably a larva without a honey gland was incorrect. The larva of *A. pheretes* possesses a honey gland and fans. Owing probably to the warm weather during August and September, three of the larvæ reached the last instar, and he was therefore able to exhibit the larva in the third, fourth, and fifth (or last) instars. *L. orbitulus* also afforded "forward" larvæ this season, and the living butterfly of this autumnal emergence, which was exhibited, left the pupa on October 2nd; but *Vacciniina optilete*, without exception, stopped at the third or hibernating instar.—Mr. J. H. Durrant, two new British species of *Ithyacionia*, Hb. (—*Retinia*, Gn.; *Evetria* Hb. Meyr.), viz. *Ithyacionia purdeyi*, sp. n., taken among Scots firs at Folkestone at the end of July, 1911, by Mr. W. Purdey, a very distinct species intermediate between *sylvestrana*, Crt. and *duplana*, Hb.; and *R. logea*, sp. n., from Forres, Scotland (W. Salvage and H. McArthur), closely allied to *duplana*, Hb. and *posticana*, Ztst. The type male of this new

species is the specimen figured as *duplana* by Barrett ('British Lepidoptera,' xi. pl. 476, fig. 2); the female is similar but smaller than the male and somewhat more distinctly marked. *R. duplana*, Hb. male and female, as also both sexes of *R. posticana*, were exhibited for comparison. — Mr. J. H. Durrant also exhibited eighteen specimens of *Colias* taken by himself in a field of lucerne at Barcote, near Farringdon, Berks, from September 4th to 10th, 1892. These comprised both *hyale* (two) and *edusa* (fourteen) and two aberrations of the latter, one of a very light orange colour (ab. *helicina*) and the other a fine ab. *helice*. All the specimens of *C. edusa* were of a yellowish orange tint. — Mr. W. J. Lucas, specimens of *Sympetrum fonscolombii*, a species very seldom taken in Britain and quite new to the Forest, taken by him at a pond in the south of the New Forest, on August 4th, 7th, 8th, 25th, and 29th, all but one being males. *S. fonscolombii* is usually considered to be a casual visitor only to our shores, but this case seems rather to throw doubt on this supposition, for the date is a late one. The insects on the first visit to the pond were very fresh; one was a female, which looked even fresher than the males, and females seem seldom to join migratory swarms. — Dr. F. A. Dixey read a letter received by him from Mr. E. A. Agar, of Dominica, West Indies, on the subject of the separation of the sexes of *Hypolimnas misippus*, the writer remarking that in that island, although haunting similar localities, the female remains on the coast while the male is to be met with some distance inland. The former is scarcely ever to be seen in company with the male of its own species, although it flies with *Danaida plexippus*, of which it is a mimic. Dr. Dixey remarked that it was a common experience that one sex of a butterfly at any given time was more in evidence than the other. Mr. Millar, of Durban, had drawn his attention to the fact that, speaking generally, the males were more apt to be on the wing during the morning, and the females in the later hours of the day. Dr. Longstaff observed that in North Africa certain species of *Teracolus* gave abundance of males in the morning, whilst in the afternoon the females predominated greatly. — Professor Poulton exhibited the cocoon of the Hysid moth *Deilemora antinorii*, Oberth., which Mr. W. A. Lamborn had intended to exhibit on June 7th last. He also exhibited examples from three of the all-female broods obtained by Mr. W. A. Lamborn, chosen because they prove that the unisexual batches are not necessarily associated with either of the forms of *encedon* in the locality, one brood being all *lycia*, another all *encedon*, while the third was as nearly as possibly half and half (23 to 24). Professor Poulton also exhibited a series of eight *A. alciope* and five *A. aurivillii* bred in the present year by Dr. G. D. H. Carpenter from thirteen small larvae found on a single leaf of the food-plant on Damba Island, in the Victoria Nyanza, to the east of Entebbe. The result entirely confirmed the conclusions of Mr. Eltringham and Dr. Jordan that *A. aurivillii* is the female of *A. alciope*. — The Rev. G. Wheeler exhibited some living workers of a small ant, identified by Mr. Donisthorpe as *Monomorium pharaonis*, imported from Madeira, and now settled in England, together with several butterflies whose bodies and heads had been devoured by them while in the setting box. He

observed that these insects had all been killed in the cyanide bottle, whilst others in the same setting box, which had been injected with oxalic acid, were left untouched.—The President said that about the beginning of July this year he had noticed, while collecting near El Guerrah, the junction for Constantine, Biskra and Alger, both sexes of the yellow and black *Leucospis gigas* and of another red and black *Leucospis*, flying in great numbers round a cairn of stones on the top of a hill, and suggested that the common instinct to seek high places might provide a meeting-place for the sexes.—Commander Walker read the following papers:—(1) "Report on a Collection of Bombyliinae (Diptera) from Central Africa, with Descriptions of New Species," by Professor Mario Bezzi, Turin, Italy (communicated by G. A. K. Marshall, F.E.S.). (2) "An Enumeration of the Rhynchota collected during the Expedition of the British Ornithologists' Union to Central Dutch New Guinea," by W. L. Distant. (3) "*Æstridæ cavicolæ*," by Ivan E. Middleton, F.E.S., of Serampore, India.—GEORGE WHEELER, M.A., *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — *October 17th, 1911.* — *Abraxas grossulariata*, abs. Rev. C. R. N. Burrows exhibited a number of aberrant examples, mostly bred from larvæ collected at Macclesfield and Wallasey; these included a specimen of ab. *lacticolor* (Raynor) with basal area of superiors suffused with black, also ab. *fulvapicata* (Raynor) and others with increase of black marking.—Zygæuids. Mr. E. A. Cockayne a number of five and six spotted specimens of somewhat doubtful identity from a colony found in a field in Berkshire, which produced both forms in June, 1911.—*Peronea variegana*. Mr. J. E. Gardner a very variable series, mostly collected in a garden at Clapton.—*Edamatophorus lithodactylus*. Mr. G. H. Heath a series from S. Wales showing colour variation parallel to that occurring in *Pterophorus monodactylus*.—*Smerinthus populi*. Mr. L. W. Newman a long series bred ex selected Bexley parents, ranging from pink flushed forms to pale cream coloured, and including two hermaphrodites, of which ten were bred ex one thousand pupæ.—*Angerona prunaria*: effect of environment. Mr. C. P. Pickett some half dozen series, mostly from same brood, reared ab ovo under different coloured muslins; the series as shown displayed marked differences in coloration which the exhibitor attributed to the varying environment.—*Ctenonympha pamphilus*, ab. Mr. J. Riches, a dingy brown specimen with pale patch in marginal area of inferiors, Lewes, August, 1911.—*Colias edusa*, vars. Mr. A. J. Willsdon specimens from Plymouth and Torquay, 1900, including females without usual yellow patches on black margin of superiors, and the lemon coloured form of var. *helice*.—Mr. Willsdon recalled having captured a freshly emerged *C. hyale* early in June of the following year.—*Colias hyale*. Mr. L. W. Newman reported that males taken in September and kept for ova showed no inclination to lay, and seemed disposed to hibernate.—*Vanessa cardui* and *Sphinx convolvuli*: short larval period. Mr. Newman recorded that by feeding up larvæ in a hothouse he had secured the completion of this stage in three weeks for the former and twenty-six days for the latter.—S. J. BELL, *Hon. Sec.*

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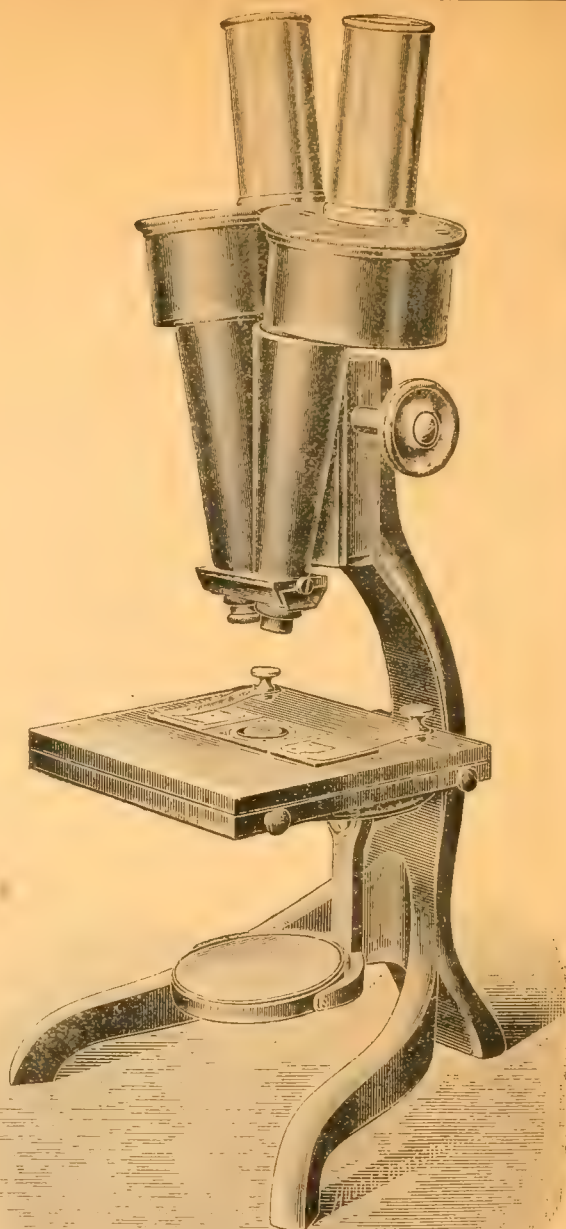
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Duplicates.—Argentula, Linariata,* A. Pygmæana, Pinicolana.* *Desiderata*.—Many local and common species, including Tortrices.—(*Lt.-Colonel*) *C. G. Nurse*; *Timworth Hall, Bury St. Edmunds.*

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Duplicates.—Iris,* Pruni, Andreniformis,* Exulis, Auricana (2, white pins), Spargani,* Favicolor, Alpina,* Rubiginea, Baretti var. Ficklini (2), Exigua, Conspicillaris,* Concolor, Bicuspis,* Consonaria (black), Gnaphalii,* Nubeculosa,* Strigillata (white pins), Reticulata,* Atomaria (melanic), Robsoni, Venustula, Pyrophila, hybrid Zonaria, Hirtaria. *Desiderata*.—X. Ocellaris and good varieties only.—*Percy M. Bright*; *Fairfield, Wimborne Road, Bournemouth.*

Duplicates.—Notha, Puta, and Campanulata. *Desiderata*.—Numerous.—*H. Woodhead*; "Holmeleigh," 55, *West End Road, Southall, Middlesex.*

Duplicates.—Rubiginia*, Degeneraria,* Fumata, Putrescens, Caniola, Hispidus, Cursoria, Præcox, Ambigua, Aurago, Citrigo, Nigra, &c. *Desiderata*.—Sesias, pupæ of many species; also Exotic Papilios and books on Exotic Butterflies and Moths.—*J. Walker*; 7, *Mount Hermon Road, Torquay.*

Duplicates.—Arion (Cornwall), Artemis* (Berks), Cracæ, Ficklini (2, worn), Nigrocincta (5, fair), Cingulalis, Obscurata (Cornwall), Delamerensis, Viretata. Pupæ: Suffumata, Pulchellata, Venosata, Galiata. Ova: Cracæ, Caja, Chi (dark Yorks). *Desiderata*.—Hyale, Edusa, Helice, Lucina and pupæ, Atalanta larva or pupæ, blue female Adonis and Corydon, Arion (Glos.), Athalia, &c. Local moths.—*G. B. Oliver*; 8, *Park Road, Sutton Coldfield.*

Duplicates.—Grossulariata ab. Varleyata, a few fine bred specimens. *Desiderata*.—Achillea, Ilcifolia, Musculosa, Extranea, Palustris (female), Crinanensis, Xerampelina var. Unicolor, Satur. Ni, Fuliginaria, Roboraria (black var.), Innotata, Salicalis, Unionalis, Semirufa, Splendidella, Terebrella, Verrucella, Rubrotibiella, good varieties of Grossulariata and other species; local forms, &c.—*Geo. T. Porritt*; *Elm Lea, Dalton, Huddersfield.*

Duplicates.—Cinxia, Io,* Epiphron, Z. Trifolii,* Geryon, Plantaginis, Hera, Interragationis (fair), Cracæ (fair), Chi, Flavicincta, Nupta, Sponsa, Fuscantaria (fair), Olivata, Munitata, Cæsiata, Atrata, Elutata (dark vars.), Pedaria (dark).

Desiderata.—Sinapis, Hyale, Athalia, Artemis, C-Album, Iris, Blandina, Pruni, Betulæ, Arion, Paniscus, Lineola, Actæon, to complete; also other butterflies and moths.—*A. H. Foster*; 13, *Tilehouse Street, Hitchin, Herts.*

Duplicates.—*N. Cinxia*, well set on black pins, bred condition, 1911.—*Desiderata*.—Many local species.—*G. Nobbs*; *North Lodge, East Cowes, I.O.W.*

Duplicates.—*Argentula*, *Unangulata*, *Geryon*, *Salicis*,* *Z. Trifolii*,* *Desiderata*.—Numerous.—*S. Talbot-Thorne*; *Holmdale, 53, Ackland Road, Bournemouth.*

Duplicates.—*Sibylla*, *T. Rubi*, *Bellargus*, *Lobulata*, *Belgiaria*, *Uncula*. *Desiderata*.—Numerous.—*H. Fleet, Junr.*; 7, *Park Road, Esher, Surrey.*

Duplicates.—*Cinxia*,* *C-Album*, *Typhon*, *Lucina*,* *Bellargus*, *Comma*, *Geryon*, *Dominula*,* *Irrorella*, *Chrysorrhæa*,* *Fuscantaria*,* *Desiderata*.—Numerous.—*F. S. Pardoe*; *Old Alresford Rectory, Hants.*

Duplicates.—*Jasioneata*,* *Isogrammaria*,* *Notha*, *Murinata*, *Parthenias*. *Desiderata*.—*Sagittata*, *Psittacata*, *Lignata*, *Lapidata*, *Munitata*, *Derivata*, *Simulata*, *Ruberata*, *Sexalata*, *Sparsata*, *Salicata*, *Autumnaria*, *Plumaria*, *Pinetaria*, *Saponaria*, *Ulvæ*, *Ridens*, *Dodonea*, *Cucullina*, *Plumigera*, *Asellus*, *Ligniperda*, *Urticæ*, *Sericea*, *Muscerda*, *Strigula*, *Exulans*, *Formiciformis*, *Myopæformis*.—*H. A. McNaught*; *Hazeldene, Penbury Street, Worcester.*

Duplicates.—*Cinxia*,* *Argiolus*,* *Carpini* (male), and odd specimens of many including *Atriplicis*, *Chryson*, *Sparganii*, &c. Ova: *Popularis*. *Desiderata*.—Numerous well-set imagines. Lists exchanged.—(*Dr.*) *Beckwith Whitehouse*; 52, *Newhall Street, Birmingham.*

Duplicates.—*Campanulata*,* *Subciliata*,* *Absinthiata*,* *Tridens*,* *Umbra*,* *Mundana*,* *Russata* (var. *Commanatata**), *Fuscata*,* *Nupta*, *Flavicincta*, *Templi* (very fair), *Megacephala*, *Cribrum*, *W-Album*,* *Dilutata*,* *Actæon*, *Valligera*, *Cursoria*, *Ripæ*, *Aprilina*,* *Triangulum*, *Affinis*, *Derasa*, *Gemina*, *Tersata*,* *Ribesaria*,* *Syringaria*, *Rubidata*,* *Badiata*, *Lithoriza*, *Geryon*, *Blomeri*, *Aurago*,* *Desiderata*.—Numerous.—(*Rev.*) *A. M. Downes*; *Batheaston Vicarage, Bath.*

Duplicates.—*Urticæ*,* *Ægon*, *Argiolus*, *Linea*, *Statice*, *Hectus*, *Antiqua*, *Glaucata*, *Cæruleocephala*,* *Arcuosa*, *Pyramidea*, *Stabilis*,* *Pistacina*, *Diffinis*, *Oxyacanthæ*, *Capucina*, *Meticulosa*, *M. Trifolii*, *Parthenias*, *Luteolata*, *Macularia*, *Prunaria* (males), *Margaritaria*, *Bilunaria* (*Juliaria*), *Queurcinaria*, *Fuscantaria*, (fair), *Pedaria* (males), *Hirtaria* (females), *Crepuscularia*, *Punctularia*, *Linearia*, *Remutaria*, *Amataria*, *Temerata*, *Adustata*, *Marginaria* (males), *Aurantaria*,* *Defoliaria*,* *Æscularia* (males), *Dilutata*, *Albicillata*, *Sociata*, *Designata*, *Truncata*, *Immanata*, *Testata*, *Fulvata*, *Plumbaria*. Pupæ: *Hirtaria*, *Aurantaria*, and *Defoliaria*. Ova: *Antiqua*. *Desiderata*.—Many common species and pupæ.—*D. P. Betts*; 65, *Waterloo Road, Leyton, Essex.*

Duplicates.—*Hyale*, *Lucina*, *Corydon*, *Statice*, *Sylvinus*, *Batis*, *Diluta*, *Flavicornis*, *Rufa*, *Fulva* (red and white forms), *Ochracea*,* *Hepatica*, *Gemina*, *Ophiogramma*,* *Tritici*, *Glareosa* (red and grey forms), *Dahlii*, *Litura*, *Protea*, *Unca*, *Parthenias*, *Macularia*, *Hirtaria*, *Betularia* var. *Doubledayaria*, *Papilionaria*,* *Abietaria** (melanic), *Repandata*,* *Consortaria*, *Albicillata*. *Desiderata*.—All *Sesias* except *Tipuliformis*, *Chlorana*, *Strigula*, *Pygmæola*, *Sericea*, *Muscerda*, *Limacodes*, *Asella*, *B. Trifolii*, *Gonostigma*, *Carmelita*, *Trepida*, *Dodonea*, *Curtula*, *Cordigera*, *Promissa*, *Sponsa*, and numerous *Geometræ*.—*W. H. C. Bolton*; 48, *Philbeach Gardens*; *Earl's Court, S.W.*

Duplicates.—*Io*,* *Ocellatus*,* *Lonicæræ*, *Ianthina*,* *Rubricosa*,* *Gracilus*, *Ornithopus*, *Tripartita*,* *Triplasia*,* *Bractea*, *Biundularia*, *Contiguaria*,* *Dilutata*,* *Christyi*,* *O. Autumnata*,* *Filigrammaria*,* *Castigata*,* *Trisignaria*,* *Virgaureata*,* *Minutata*,* *Dodoneata*,* *Ruberata*,* *Fluviata*,* ova of *Dilutata*, *Christyi*, and *O. Autumnata*. *Desiderata*.—Various.—*J. E. R. Allen*; *Portora, Enniskillen, Ireland.*

Duplicates.—*Edusa*, *Paphia*, *Valezina*, *Adippe*, *Aglaia*, *Tithonus*, *Ægon*, *Agestis*, *Adonis*, *Corydon*, *Argiolus*, *Sylvinus*, *Velleda*, *Dominula*, *Russula*, *Plantaginis*, *Urticæ*,* *Chrysorrhæa*,* *Monacha*,* *Fascelina*,* *Coryli*,* *Vespertaria*, *Apiciaria*, *Prunaria*,* *Fasciaria*, *Alniaria*,* *Tiliaria*,* *Fuscantaria*,* *Angularia*,* *Betularia*,* *Abruptaria*,* *Cinctaria*, *Consortaria*, *Consonaria*, *Extersaria*,* *Inornata*, *Nigra*, &c. *Desiderata*.—*Hyale* (2), *Arion*, *Paludis*, *Gnaphalii*, *Pandalus*, *Palealis*, *Ulmella*, *Conspicualis*, *Empyrea*, *Grotiana*, *Penziana*, *Aspidiscana*, &c.—*Charles Fenn*; *Eversden House, Burnt Ash Hill, Lee, Kent.*

Duplicates.—*Selene*, *Io*,* *Blandina*, *Semele*, *Hyperanthus*, *B. Rubi** (a few),

Pennaria, Pilosaria, Leucophearia (male), Multistrigaria,* Albulata, Tristata, Suffumata, Pyraliata, Atrata, Flavicornis, Rumicis, Fulva, Rurea, and var. Combusta, Graminis, Gemina, Augur, Brunnea,* Festiva,* Munda,* Rubricosa,* Cruda,* Cerago,* Silago,* Chi, Nebulosa, Typica,* &c. *Desiderata*.—Very numerous.—*G. Fleming*: 9, *Fairview Terrace, Merthyr Tydfil*.

Duplicates.—Ocellatus,* Tringulum,* Iota,* Xerampelina,* Fimbria,* Rufa, Interjecta,* Gracilis, Rarida, Pupa of Sagittata. *Desiderata*.—Galli, many of the Clearwings, Chlorana, Senex, Russula (females), Hamula, Cratægi, Trifolii, Unguicula, Fagi, Dictæoides, Chaonia, Dodonea, Rideni, Myricæ, Turca, Rubiginea, Retusa, Tineta, Chryson, Bractea, Promissa.—*James D. Coward*; *Haverholme Gardens, Sleaford*.

Duplicates.—Blandina, Selene, Davus, Rumicis, Littoralis,* Micacea, Graminis, Testacea, Literosa, Valligera, Cursoria, Nigricans (dark), Triciti, Orbona, Typica, Gothica, Opima, Gracilis (dark), Lota, Zonaria, Elutata, Grossulariata (vars.), Progemmaria, Escularia, Multistrigaria, Olivata (fair), Tenuiata, Munitata, Montanata, Immanata, Testata, Rubiginata, and var. Plumbata. *Desiderata*.—Very numerous.—*J. M. Muirhead*; *Norwood, Headroom Gate Road, St. Annson-Sea*.

Duplicates.—Edusa, Adonis, Alsus, H. Comma, S. Ligustri,* Globularia, Z. Trifolii, Dominula, Chrysorrhœa, Lanestris,* Prunaria,* Fuscantaria,* Hirtaria,* Consonaria, Ulmata, Subnotata,* Puta, Pisi,* Myrtilli.* *Desiderata*.—Numerous.—*C. Levett*; 12, *Borneo Street, Putney, S.W.*

Duplicates.—Advena, Ditræpezium, Populeta, Glauea, Tineta, Gracilis, Miniosa, Interjecta, Advenaria, Munda, Flavicornis var. Scotica, dark Impluviata, Adusta, Blanda, Alsines, Ambigna, Præcox, Hawthorthii, Cursoria, Suspecta, &c. *Desiderata*.—Sexalata, Bajularia, Formicæformis, Myopæformis, Muscerda, Esculi, Quadra, Castaneæ, Lignata, Virgaureata, Plumbeolata, Cucubali, Lichenea (Portland), Sparsata, Black Rectangulata, Vitalbata, Strigula, Oo, Absynthiata, &c.—*E. A. Cockayne*; 16, *Cambridge Square, W.*

Duplicates.—Very fine black Repandata,* Nebulosa and var. Robsoni,* Flavicornis, badiata.* *Desiderata*.—Connexa, Sordida, Furva, Depuncta, Sobrina, Occulta, Glabraria, Berberata, Lapidata, Griseata, Rufata, Fluctuosa, Hera, Lychmitis, and many local varieties.—*Wm. Mansbridge*; 4, *Norwich Road, Wavertree, Liverpool*.

Duplicates.—Dissimilis,* Velleda, Captiuncula, Fibrosa, Melanopa, Cordigera, Ambigna,* Lutosa, Rufa, Lubricipeda var. Fasciata,* Plantaginis,* Cambrica and dark vars. Coracina, Blandiata, Hexapterata, Bidentata* (black), Carbonaria (6), Fluviata,* Pumilata,* Linariata,* Bicolorata var. Plumbata, &c. *Desiderata*.—Fuciformis (narrow), Guenii, Albimacula, Irregularis, Barrettii, Obfuscata, Taniata, Virgaureata, Consignata, Dipsacea, &c.—*T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough*.

Duplicates.—Statice, Senex, Diluta, Alsines, Umbrosa, Emarginata, Aurantiaria Unangulata, Silaceata, Pusillata, Dodoneata, Albipunctata, Truncicotella, Latistrius, Selasellus, Uliginosellus, Black Crepuscularia, &c. *Desiderata*.—Numerous.—*Major Robertson*; *Fairlawn, Chandlers Ford, Hants*.

Duplicates.—Myopæformis,* Menyanthidis, Myricæ, Aphigramma,* Glauea, Melanopa, Cordigera, Maritima, Geminipuncta, Salicata, Flavicinctata,* Carbonaria, Trepidaria and Adequata. *Desiderata*.—Sphegiformis, Castaneæ, Asella, Strigula, Confusalis, Sericea, Russula (females), Binaria, Octogesima, Fluctuosa, Quadrifasciaria, Sagittata, Reticulata and Griseata. Black pins and data.—*Francis C. Woodbridge*; *The Briars, Gerrards Cross, Bucks*, after 14th October.

TO CORRESPONDENTS.—All notes, papers, books for review, &c. and notices of change should be sent to the Editor—

RICHARD SOUTH, 96, DRAKEFIELD ROAD, UPPER TOOTING, S.W.

CHANGES OF ADDRESS.—*J. Tetley*, from "Rathkeale," Churchfield Road, Walton-on-Thames, to "Branksome," Terrace Road, Walton-on-Thames. *F. W. Frohawk*, from Raleigh, Essex, to Stanley House, Park Road, Wallington, Surrey. *H. Wood*, from "Elim," to "The Nook," Kennington, near Ashford, Kent. *E. Mannering*, from 74, Bolsover Street, W., to Sunnybrae, York Road, Woking.

H. V. Plum, *from* The School House, Skipton-in-Craven, *to* Kelly College, Tavistock. Arthur J. Rose, *from* "Glanmor," Berkhamsted, *to* Harewood Road, South Croydon. *After October 10th, 1911*:—J. J. Joicey, *from* The Homestead, Bourne End, *to* The Hill, Witley, Surrey; A. Noakes, *from* Rolle Cottage, Bourne End, *to* The Hill, Witley, Surrey.

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EXCHANGE.

Duplicates.—Very fine black Repandata,* Nebulosa,* and var. Robsoni, Flavicornis, Marginaria var. Fuscata, Fimbria, Dominula.* *Desiderata*.—Black Cambricaria (W. Ridg), black Menyanthidis, Consonaria, Albovenosa, M. Castaneæ, Lutarella, Unca, Reticulata, Cuprealis, Murana, Alpina, Stachydalis, and last month's list.—Wm. Mansbridge; 4, Norwich Road, Wavertree, Liverpool.

Duplicates.—Campanulata,* Subciliata,* Absinthiata,* Tridens,* Mundana,* Russata (var. Comma-Notata*), Fuscantaria,* Nupta, Flavicineta, Megacephala, Dilutata,* Actæon, Valligera, Cursoria, Triangulum, Affinis, Derasa, Gemina, Tersata,* Ribesaria,* Syringaria, Badiata, Lithorhiza, Geryon, Blomeri, Aurago, Imitaria,* A. Ligustri* (1), Nigricans. *Desiderata*.—Numerous.—(Rev.) A. M. Downes; Batheaston Vicarage, Bath.

Duplicates.—In addition to those offered in last month's 'Entomologist': Rumicis, Elymi (6), Phragmitidis, Nigra, Glareosa, Mundana, Autumnaria,* Satyrata, Isogrammata,* Subfulvata,* Halterata, Corylata, Badiata,* Cæsiata, Decolorata, Cervinata,* Tristata, Luteata, Impluviata, Designata, Olivata, &c. *Desiderata*.—Hyale, Betulæ, Pruni, Palæmon, Tiliæ, Myopiformis, Rubricata, Simulata, Lapidata, Assimilata, Minutata, Consignata, &c., including Tortrices, &c.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—Carbonaria, Trepidaria, and dark forms of Geminipuncta,* and pupæ of Nigricæ. *Desiderata*.—Bidens, Bondii, Cannæ, Arundineta, Turfosalis, Glabraria, Luridata, Pygmaæta, Helveticaria, Minutata, and Sparsata.—Francis C. Woodbridge; The Briars, Gerrard's Cross, Bucks.

Duplicates.—Full-fed larvæ in sticks, and in cocoon ready for pupation. Bembeciformis, Culiciformis, Andreniformis. Imagines: Bembeciformis,* Papiionaria,* Argiolus.* *Desiderata*.—Machaon, Egeria, Megæria, Sybilla, Paphia, Betulæ, Cardui, Aglaia, Porcellus, Elpenor, Carpinii, B. Rubi, Trepida, B. Quercus, Falcula, Bifida; also pupæ and preserved larvæ of the same.—A. Exeter; Southern Hospital, Dartford, Kent.

Duplicates.—Bellargus, Dominula,* Monacha,* Deplana, Fimbria,* Fulva, Glareosa, Suffusa, X. Ocellaris, Autumnaria* (dark), Abietaria,* Repandata,* Dealbata, Gilvaria, Obliquaria. *Desiderata*.—Numerous.—H. Worsley-Wood; 31, Agate Road, Hammersmith, W.

Duplicates.—Saturnidæ, about sixty species, many preserved larvæ and live cocoons; Parnassius ex Turkestan. *Desiderata*.—Saturnidæ and Parnassiinae only.—J. Henry Watson; 70, Ashford Road, Withington, Manchester.

Duplicates.—Templi (4, very fair). *Desiderata*.—Machaon, Hyale, Edusa, and very many others.—C. P. Gledhill; 35, Leyburn Grove, Shipley.

Duplicates.—Z. Trifolii,* Senex, Griseola, Salicis,* Pudorina, Phragmitidis, Fibrosa, Strigilis, Haworthii, Nigricans, Baja, Affinis, Lucipara,* Moneta,* Interjecta, Argentula, Fuscantaria, Elutata,* Unangulata, Testata,* *Desiderata*.—N. Strigula, Dromedarius, Curtula, Leporina, Petasitis, Subtusa, Lichenaria, Sylvata, Rusticata, Salicata, Valerianata, Subciliata, Dodoneata, Togata, Sparsata, Sexalata.—G. Brooks; 28, Hilton Avenue, Friern Barnet, N.

Duplicates.—Paphia, Polychloros, Dominula, Griseola, Contigua,* Pisi, Littoralis, Fulva, Rurea ab. Combusta, Sublustris, Herbida, Oxyacanthæ ab. Capucina, Xerampelina (2 only), Munda, Lunosa, Obscurata, Advenaria, Autumnaria, Albicillata, Illunaria, Juniperata,* Luteata, Ochrata. *Desiderata*.—Numerous, especially Subtusa, Retusa, Pakeacea, Affinis, and Diffinis.—(Captain) P. A. Cardew; 50, Melbury Gardens, Cottenham Park, Wimbleton.

Duplicates.—Advenaria, dark Impluviata, Flavicornis var. Scotica, Miniosa, Munda, Advena, Tincta, Hirtaria, Statices, Deplana, Blanda, Ambigua, Alsines, Galatea, Bellargus, H. Comma, &c. *Desiderata*.—Sexalisata, Plumbeolata, Bajularia, Quadra, Lignata, Vitalbata, Dodonea, Esculi, &c.—E. A. Cockayne; 16, Cambridge Square, London, W.

Duplicates.—Dictæa,* Ziczac,* Ripæ, Præcox, Moneta, Chrysitis, Prunaria,* Tiliaria,* Leucophæaria. *Desiderata*.—Numerous. Good specimens well set on black pins only.—(Miss) A. D. Edwards; The Homestead, Coombe Hill, East Grinstead.

Duplicates.—African Butterflies in papers. *Desiderata*.—British Lepidoptera, set on black pins.—Joseph Anderson; Alre Villa, Chichester.

Duplicates.—A large number of good specimens of many species for distribution. Send box and postage.—*W. Crocker*; 53, *Park Terrace, Gillingham, Kent*.

Duplicates.—*M. Cinxia*, well set on black pins; best condition, 1911. *Desiderata*.—*C. Palæmon*, *A. Comma*, *P. var. Valesina*, *A. Cratægi*.—*G. Nobbs*; *North Lodge, East Cowes, Isle of Wight*.

Duplicates.—Ova: *Chi*, *Olivacea* var. *Nigrescens*, *O. Autumnata* (type and melanic), *E. Autumnaria*, *Testata* (vars.). Pupæ: *Bidentata*, *Hastata*, *Innotata* (*Durham*, very few), hybrid (*Hirtaria* × *Zonaria*), *Reclusa*, *Dromedarius*. *Desiderata*.—Ova: *Tiliaria*, *Angularia*. Pupæ: *Prodromaria*, *Omicronaria*, *Porata*, *Pisi*, *Bidentata* (black), *Suasa*, *Thalassina*, *Genistæ*, *Illunaria*, *Chaonia*, and offers in early stages only.—*J. W. Harrison*; 181, *Abingdon Road, Middlesborough*.

Duplicates.—*Epiphron*, *Adonis*, *Geryon*, *Meliloti*, *Dominula*,* *Hera* (3), *Fuliginosa*, *Chrysorrhœa*,* *Pudorina*, *Phragmitidis*, *Glareosa*, *Brunnea*,* *Dahlii*, *Flavago*, *Nigra*, *Vetusta*, *Exoleta*, *Solidaginis*, *Umbra*, *Chryson*, *Moneta*,* *Melanopa*, *Ornithopus*, *Pastinum*, *Apiciaria*, *Syringaria*,* *Tetralunaria*,* *Autumnaria*,* *Hirtaria*,* *Coracina*, *Annulata*,* *Strigillaria*, *Cæsiata*, *Linariata*,* *Venosata*,* *Debiliata*,* *Polycommata*,* *Fluviata*, *Prunata*,* *Silaceata*,* *Virgata*,* *Desiderata*.—Numerous.—(*Rev.*) *W. G. Whittingham*; *Knighton Vicarage, Leicester*.

Duplicates.—*Euphrosyne*, *Argiolus*, *Senex* (5), *Salicis*,* *Neustria*,* *Spinula*, *Perla*, *Pallens*, *Paludis* (poor), *Popularis*, *Blanda*, *Cubicularis*, *Puta*, *Suffusa*, *Segetum*, *Porphyrea*, *C-Nigrum*, *Triangulum*,* *Brunnea*,* *Umbrosa*, *Ianthina*, *Fimbria*,* *Pyramidea*, *Tragopogonis*, *Serena*, *Dentina*, *Chenopodii*, *Chrysitis*, *Repandata*,* *Incanaria*, *Promutata*, *Straminata* (1), *Imitaria*, *Amataria*, *Piniaria*, *Centaureata*, *Procellata*, *Rubidata*, *Ferrugata*, *Tersata*, *Vitalbata*, and *Associata*, and many odd specimens. *Desiderata*.—Very numerous.—*Leslie H. Mosse Robinson*; *Margaret Villa, Portchester, Hants*.

Duplicates.—*Batis*, *Flavicornis*, *Ochracea*, *Fulva* (red and white forms), *Hepatica*, *Gemina*, *Glareosa*, *Litura*, *Citrigo*, *Diluta*, *Protea*, *Unca*, *Abietaria* (melanic), *Albicillata*, *Statices*, *Geryon*. *Desiderata*.—Numerous.—*W. H. C. Bolton*; 48, *Philbeach Gardens*; *Earl's Court, S.W.*

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Duplicates.—*Edusa*, *Cardui*, *Egeria*, *T. Rubi*, *Adonis*, *Ægon* (female vars.), *W. Comma*, *Semele*, *S. Populi*,* *Geryon*, *B. Quercus*,* *Potatoria*,* *Illustraria*,* *Autumnaria*,* *Hirtaria*,* *Pulchellata*,* *Ziczac*,* *Promutata*, *Derasa*, *Batis*, *Lithorhiza*,* *Verbasci*,* *Nigra*, *Lichenea*, *Saucia*, *Suffusa*, *Lunosa* (vars. *Rubra* and *Olivacea*), *Luctuosa*, *Furcula*, *Petrifacta*, pupæ of *Pudibunda*, *Acularia*, and *Lithorhiza*. *Desiderata*.—*C-Album*, *Betulæ*, *Medea*, and very numerous *Heterocera*. Pupæ: *Ocellatus*, *Tiliæ* (wild), *Zonaria*, and many others.—*A. J. Spiller*; *Godolphin Cross, Helston*.

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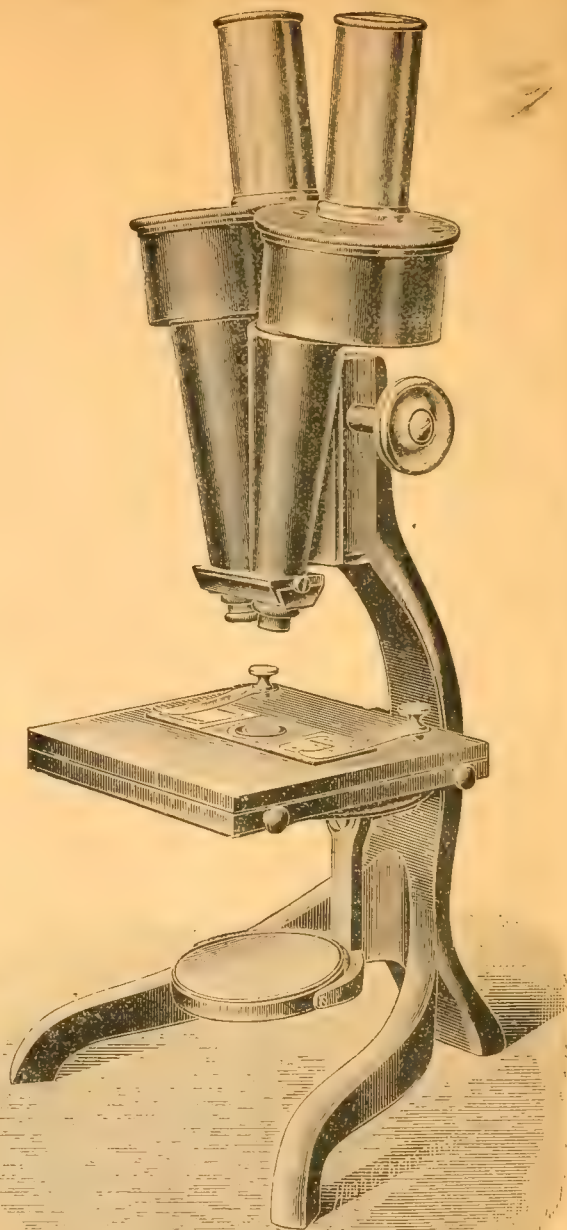
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